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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Merchant Shipper

THE merchant shipper has played a great part in the development of British overseas trade, and his adventures of the past are rich in romance. He is still a commercial power, though the scope of his operations may of late have been restricted. This is due largely to the influences that are tending to change Great Britain from an importing into a manufacturing country. The change of late years has been marked in chemical products. In dyestuffs, fine chemicals, and many other branches of industrial chemistry, it was formerly the practice to look to foreign rather than to home producers. The chemical merchant of those days had a better time perhaps than he has to-day, though a good many still continue to thrive. But the emphasis to-day does seem to be placed rather on the development of home products than on dependance on foreign resources.

This, however, does not essentially change the function of the man, whatever name he goes by, who links up business between this country and overseas markets by finding out what other countries need, and how this country can supply it. Manufacturing firms probably do more of this work for themselves now than they ever did before, but that only means that they have added to the function of manufacture that of direct sale and distribution—in short, the art of merchanting. Nor need the use of more home goods really curtail the legitimate function of the shipper and merchant, for if the wonderful marketing organisation he has developed is employed in favour of native rather than of imported products he will be serving national trade even better than he formerly did.

As our Board of Trade returns have shown for some time past, our export trade in chemicals is steadily gaining ground. Apart from the natural recovery from the strike effects, this has been largely secured by the big scale publicity that of late years has been given to British chemistry and chemical engineering, and to the growing improvement in our reputation for quality of production. Results in such matters, as advertisers well know, are slow in appearing and are not always easy to trace to their source, but it is true that persistent and well directed publicity pays handsomely, and that progressive firms of every class now recognise it as one of the essential conditions of success, especially in our vast and ever expanding overseas markets.

I.C.I. First Annual Report

THE directors of Imperial Chemical Industries, Ltd., in their first annual report to the shareholders, regard the results of the first year's operations as "very satisfactory." In view of the heavy costs of organisation and the difficulty of co-ordinating the operations of four such great units, this opinion will be generally endorsed. The profit amounts to £4,567,225; the dividends proposed are 7 per cent. on the preference shares, 8 per cent. on the ordinary shares, and $1\frac{3}{4}$ per cent. on the deferred shares; £408,976 is transferred to general reserve and £82,680 is carried forward. Large expenditure, it is stated, has taken place on new capital works, which has been entirely financed out of the resources of the subsidiary companies. For this purpose, investments have been realised, resulting in a capital profit arising to the selling companies which exceeds £1,000,000. This profit has been carried to reserve in the books of those companies, and, not having been brought into the I.C.I. accounts, forms no part of the profit of four and a half millions. During the year, ample provision has been made for obsolescence and depreciation, and operating plant and machinery has, in addition, been maintained in a fully efficient condition. Considerable progress is reported to have been made with the consolidation of all the interests brought together by the formation of the company.

At the annual general meeting, to be held on May 31, it is proposed to sanction an increase of the authorised capital of the company by £10,000,000, in the form of 20,000,000 shares of 10s. each, thus increasing the present authorised capital of 65 millions to 75 millions.

Of this new capital, the preference shareholders will be asked to sanction the issue of not exceeding 10 million of such shares as preference shares, ranking in all respects with the existing preference shares, the new shares so to be issued having first been consolidated into shares of £1 each. The reason for this increase of capital is that the continuous expansion of the company's business will involve large expenditure on capital account during the coming twelve months, and as the greater part of the present authorised capital has been issued and paid up, the Board considers it advisable that this further capital should be authorised, although the increase does not foreshadow an immediate issue of any substantial amount of the proposed additional authorised capital. Also, in reference to the proposed additional preference shares, it does not follow that the number of further preference shares will actually be issued. It is stated to be the intention of the Board, as far as possible, to preserve a fair and equitable proportion as between the ordinary and the deferred shares.

The Chemistry of Crime

THE testimony of chemists has been a feature increasingly in evidence in recent murder and other trials, and it now appears that consideration is being given to a scheme whereby detectives should receive some training in chemistry. In this matter fact has lagged sadly behind fiction; for many years now, Sexton Blake and Sherlock Holmes and their numerous colleagues have always packed a complete set of "Beilstein" in their luggage. In point of fact, however, scientific tests are brought to bear on evidence in certain trials to a much greater extent than most of us imagine. At his recent lecture before the Institute of Chemistry, Mr. Ainsworth Mitchell gave a remarkable account of the amazing amount of detailed evidence which may be gleaned by a specialist from a page of handwriting: it may truly be said, that with a single stroke of the pen a criminal may put a noose round his own neck. We have been told by the more worldly-wise of our friends (and we have dutifully believed it), that every advance in protection against criminals has led to a compensating advance in the technique of crime. In that case, it is to be anticipated that the time may come when, faced by a scientifically-trained detective force, the criminal will find it necessary to undergo a scientific training in his turn. This seems to solve the problem of what we are to do with our boys. Crime and punishment alike will become learned professions, and Fellows of the Institute of Chemistry who are unable to find a niche in industry or academic life will be able to become detectives, or alternatively criminals.

We trust that we may be pardoned for our facetiousness. There is no doubt that a knowledge, however slight, of chemistry and chemical tests would considerably strengthen the hands of the police, and render it increasingly difficult for the evildoer to go unpunished. In point of fact, the greatest value of a scientific education is that it imparts ability to weigh evidence on any subject logically; and that would seem to be a plain indication that all the higher ranks of the detective forces should be filled with scientifically-trained men. If we ever learn to consummate this idea, we may go further, and proceed to think scientifically not merely about the detection of crime, but even about its prevention; in which case justice will become something more than the vengeance of society on its misfits.

In Praise of Vitamins

ONE of our enterprising weekly trade publications has this week given the world a convincing account of the stimulating effects of sunlight, both natural and synthetic. It is a theme rich in suggestion and one that this climate rarely allows us to forget for any length of time. With an admirable catholicity the argument is used with equal effect both ways. If this realm should be regarded as a depressingly sunless spot, then, as assured by the arts of modern advertisement and the noble prose of the experts, the chemist and physicist come to the rescue and make up the deficiency. For the jaded sedentary worker or the weakly infant, both failing for want of natural sunlight, the mercury lamp is available, and after a few moments under its rays the one feels as if he had been on a bracing sea voyage and the other develops bone and muscle, and says good-bye to rickets. If the supply of natural codfish, again, is only equal to supplying a few watery breakfast steaks, and the cod-liver oil tank with its vitamin content dwindles to a widow's cruse, then a tablet or two carried in the waistcoat pocket furnishes the impoverished system with as much vitamin D as a shoal or two of fish could provide.

This is on the theory that natural sunlight no longer blesses this isle. At the same time, for those who still suspect modern science, we are shown alluring pictures of spots in this sunless land where the sun never sets. You may choose Llandrindod or Llanwrtyd, with their nauseous but restoring beverages, Trefriw and Strathpeffer, Harrogate and Droitwich, even beyond our borders Biarritz or Le Touquet. Thus are we taught the new version of how to make the best of both worlds—how to turn our sunshine and our sunlessness equally to account. And it is certainly something of an achievement to have told the whole attractive story of vitamins, with the aid of many authorities, without once, so far as we have noticed, mentioning the name of Gowland Hopkins.

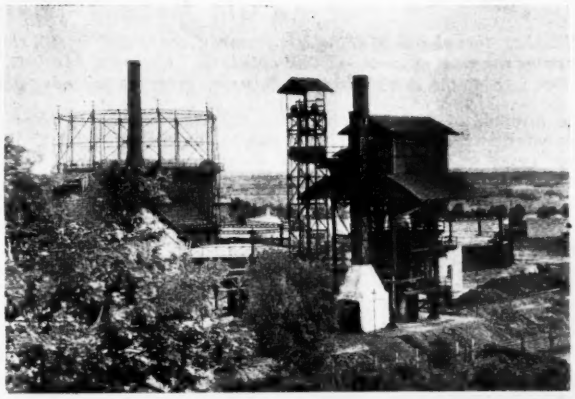
Books Received

LIQUID CHLORINE. London: Imperial Chemical Industries, Ltd.
INTERNATIONAL REVIEW OF AGRICULTURE. Rome: International Institute of Agriculture.

The Calendar

May 31	University of London: "Chemical Kinetics." Professor Max Bodenstein. 5.30 p.m.	University College.
June 1 and 4		
June 7	Chemical Society.	Burlington House.
26	National Physical Laboratory: Annual Visit of Inspection. 3 to 6 p.m.	Teddington.
Sept 5–12	British Association Meeting.	Glasgow.

INTERMITTENT VERTICAL CHAMBER PLANTS (Woodall-Duckham System) in use abroad.



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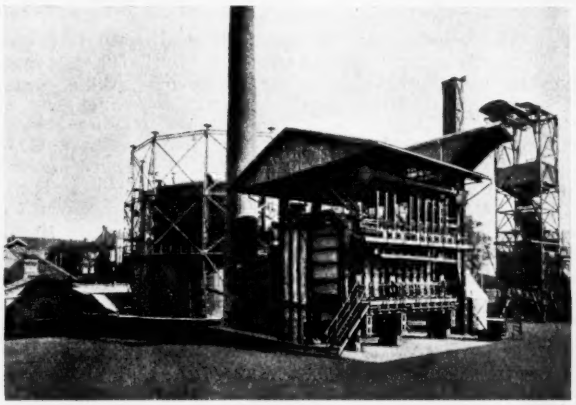

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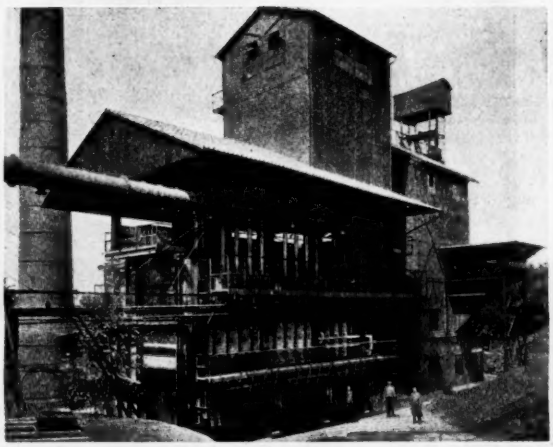
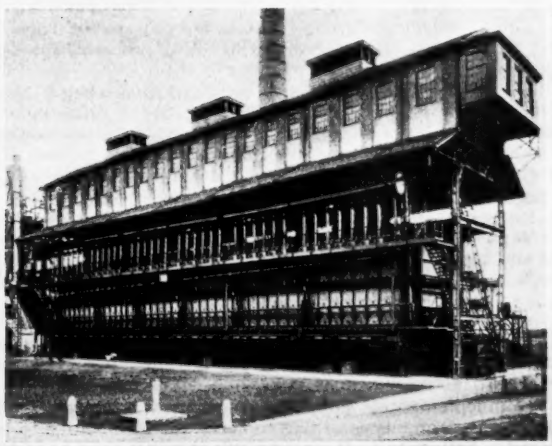


Bamberg



Chemnitz

The Use of Bags as Chemical Containers

An Old Method That Still Holds Its Place

The bag, though one of the oldest forms of container, is still claimed by many to be, in flexibility and convenience in handling, among the most efficient. In an article in "Chemical Markets," New York, Mr. H. V. Howes, director of commercial research to the Bemis Brothers Bag Co., gives the following account of the advantages of bags as chemical containers.

THE number of different chemicals that are packed in bags is constantly increasing. This is due to the cost of wood and other types of containers and the growing recognition of the new developments in bag manufacturing which have taken place within the past few years. These innovations make

FIG 1.—LOADING BAGGED CHEMICALS FOR EXPORT.

bags practical for use for many chemicals that formerly were thought to require the more costly types of containers.

Bags carry more of the world's goods than any other single type of container. In spite of this very extensive general use of bags, each commodity must have a bag especially designed for it. Bags are, therefore, "custom made" for the product which is to be packed. The reason for this is that every substance has certain individual characteristics that alter to a greater or lesser extent the type of bag to be used. For example, calcium chloride must be kept dry and free from moisture. An ordinary burlap sack will not do.

There are accordingly no stock sizes in bags, although there are, of course, regular sizes used for the specific commodities that are most commonly packed in bags.

The practical advantages of bags are many. The cost is comparatively small. Bags are easy to handle and convenient units are made so that one man can easily lift and store them away without help. Modern machinery has been developed for filling, weighing, closing, conveying, and storing bags so that labour costs are reduced and handling processes speeded up.

Tare weight on bags, which is no small item when a large volume of shipping is done, is less. Bags are so much lighter than other types of containers that a saving in tare weight of as much as 80 per cent. may be made. This reduces the freight charges on every shipment made in bags.

Bags save storage space. Filled or empty bags require a small amount of storage space. Empty bags may be packed in compressed bales of 500 each, more or less according to the size and type. One bale of 500 bags occupies the same amount of space as a single empty barrel. Filled bags are flexible and store so compactly that they save space.

Brands and trade marks may be printed on bags. Modern bag printing has reached a high state of excellence, so that brands printed on bags are a real advertising and sales asset. Bright, attractive colours of many hues are used.

Too much emphasis cannot be placed on the importance of selecting the right type of bag to carry the commodity to be packed. Failure to do this may result in breakage in handling or in transit and subsequent claims and endless correspondence and disputes.

To select the proper bag for a given chemical, all the characteristics of that substance must be taken into consideration. If it is hygroscopic, then a moisture-proof bag must be furnished. If it is a very fine powder, then a sift-proof bag is necessary. If its specific gravity is high, a strong bag that is not too large to handle conveniently must be made.

The mistake is sometimes made of trying to pack the same amount of material in a bag that has formerly been packed in a barrel or other bulky container. Usually it is not wise to do this because the flexibility of the bag makes an awkward package to handle if too great weights are packed in it. The best size in general for the average commodity is 100 to 200 lb. Stearic acid, for example, is packed in 150 lb. units and sulphur in 110 lb. units. Each product must have a bag that is "made to order" for it. A too small unit is not economical, a too large unit is awkward and cumbersome to handle.

There are four principal types of bags most commonly used for packing chemicals: Cotton bags, burlap bags, paper bags and double bags.

Chemicals are frequently packed in more than one type of bag; for borax, cotton and burlap bags are both used. Cotton bags are generally used where appearance and cleanliness are essential. The white cloth gives a fine appearance to the bag and is clean and sanitary.

Burlap bags are used where strength is paramount and appearance is not so essential. Burlap cloth is made in many weights and widths. It is, therefore, a kind of material that is adapted to many purposes. It is, moreover, strong and tough and will withstand rough handling encountered in transportation. Burlap bags are usually used when comparatively large amounts of a product are to be packed in one unit. They may be made to hold 200 to 225 lb., although smaller sizes around 150 lb. are more convenient to handle.

Paper bags are used for small units. One lb. up to 50 lb. are the most common sizes. The paper stock may be either kraft or rope paper. The latter is very strong and tough. Small size paper bags are in common use for insecticides, lithopone, and zinc oxide.

There are two types of double bags: (1) loose liners; (2) attached liners.

Loose liner bags are made of ordinary burlap or cotton cloth

FIG. 2.—AN AUTOMATIC CONVEYOR.

with burlap, cotton, or paper bag liners inserted in them. This type of bag is used to give extra strength, to prevent sifting, or exclude moisture. Granulated sugar is packed, for example, in heavy burlap bags with a light cotton liner to prevent sifting.

Attached liner bags are made of a burlap or cotton outer layer to which is attached, by a special adhesive, an inner liner of cotton or paper of one or more plies. These bags make

a very desirable container for chemicals, as they are waterproof, dustproof, and siftproof. Calcium chloride and quicklime are packed in these bags. They are also used for dry paints and colours, aluminium stearate, Glauber's salt, alum, and many other chemicals.

Many styles of equipment are on the market for handling bags. These make the process of packing, when bags are used, a comparatively simple one.

The manner in which bags are filled depends largely on the amount of a commodity handled. The simplest form of filling is to have a support for the bag or what is termed a bag holder. The product is then shovelled or scooped up into the bag, or the material may come down through a chute and thus directly into the bag. When large quantities of a commodity are being handled, mechanical packing machines are used. They are of two types, pre-weighers and gross-weighers. The pre-weighing type automatically weighs into a hopper the desired amount and discharges it into the sack in one dump. The gross weighing type weighs the sack and its contents.

Some commodities flow freely and require only the force of gravity to force the flow into the bags. Other commodities are not free flowing, that is, they will not flow in a uniform stream except when some sort of mechanical feeder or agitator is used to assist the flow. Such mechanical feeders include the auger type, belt and screw conveyors, and various types of mechanical agitators. For materials which do not of their own weight pack tightly, such as soap flakes, shaking devices are provided for jogging down the material into the sack.

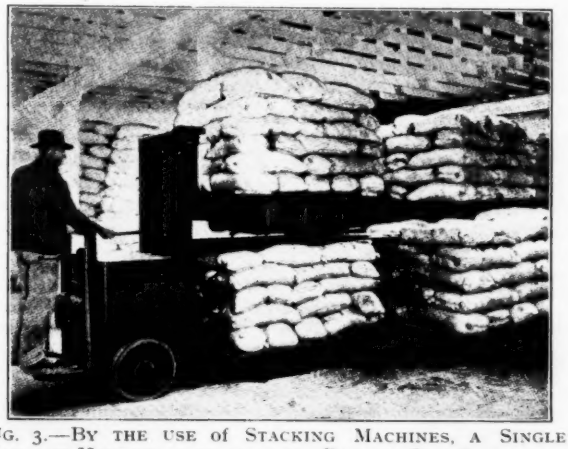


FIG. 3.—BY THE USE OF STACKING MACHINES, A SINGLE MAN CAN HANDLE 40 OR 50 25 LB. BAGS IN ONE OPERATION.

There are three methods of closing bags after they have been filled. (1) Tying the top with twine or wire. The top of the bag is simply drawn together and a piece of twine tied around it. With the wire tie a special tool, working on the principal of a ratchet screw driver, twists the wire about the neck of the bag, thus effectively securing the contents against sifting. (2) Hand sewing. The bag is sewn up, using a large needle and heavy twine, forming ears at the corners. This is the ordinary type of closure. A special twine is used that is soft, pliable, and does not kink, enabling the packers to work very fast. (3) Machine closing. This is the fastest method of closing bags and is used where the production is large. The bag is supported on a platform or conveyor and the top sewn straight across.

Bags are the easiest type of container to handle from an efficiency standpoint. One man can handle them alone, lifting, storing, and piling. They are flexible, so that drops and jolts do not injure them. Several bags can be handled at one time on an ordinary hand truck. Care should be taken to use bag trucks, as barrel trucks allow the bags to drag on the wheels. When bags drag in this manner, the abrasive action of the truck wheels soon wears through the cloth or weakens it so that breakage is likely to occur. Hooks should never be used in handling bags.

Special chutes or other gravity type chutes are used in lowering bags. Mechanical lowerators, elevators, belt conveyors, are all used in conveying from packing rooms to warehouse and freight cars. Various types of portable elevators and conveyors are in general use in tying bags when stored in warehouses.

When bags are received filled with commodities, the manner in which they are opened is of some importance. Bags have considerable salvage value after they have been used once, if they are still in good condition. If the tops are cut or have holes in them their value is much less. To open a bag tied at the top with twine it is simply necessary to cut the twine without cutting the cloth. A bag tied with a wire tie can be opened by untwisting the wire by hand. A hand sewn bag is opened by cutting the twine and pulling it out. Bags sewn by machine can easily be opened.

New developments are constantly taking place in bag manufacturing. Chemical manufacturers interested in keeping packing efficiency up to a high standard and down to a low cost may well keep in touch with these improvements and developments.

A Bookman's Column

AN interesting scheme has been initiated by the Chemical Catalog Co., of New York, whereby it is possible to purchase any of the books published by the company on a monthly payment plan. Under this plan orders will be accepted in amounts up to $60·00, and as low as $20·00. The purchaser agrees to pay one-sixth of the purchase price on receipt of the books, and a like amount each month until the account is paid in full, the total amount of the purchase to be settled within six months from the date of purchase. Orders will be accepted from any member in good standing in one of the chemical or engineering societies, or from any rated corporation or firm. Others desiring to use this plan will be accommodated on furnishing satisfactory references.

* * *

The latest volume of the American Chemical Society Monograph Series, *Fundamentals of Dairy Science* (The Chemical Catalog Co., pp. 543, $5.50), is a remarkable example of co-operative effort. In the place on the title-page usually reserved for the name of the author appears the inscription: "By associates of Lore A. Rogers in the research laboratories of the Bureau of Dairy Industry, United States Department of Agriculture." Dr. Rogers has been, since 1902, bacteriologist to the Dairy Division, Bureau of Animal Industry, and Bureau of Dairy Industry of the United States Department of Agriculture. The book is planned in four main sections: the constituents of milk; the physical chemistry of milk and milk products; the microbiology of milk and milk products; and the physiology of milk secretion. These sections are divided into chapters. The main topic of each chapter is usually further sub-divided, each subsection being written by a different author. Specialisation could hardly go further, and the result is a book which is a mine of information and should be a great stimulus to workers in this field. The numerous contributors include Professors L. S. Palmer, W. M. Clark, and R. A. Gortner. It may be added (for the benefit of literary purists who dread a clash of styles) that the editorial committee have modified the original manuscripts where necessary in order to unify the general scheme of the book.

* * *

To a number of generations of students, Professor J. B. Cohen's *Organic Chemistry for Advanced Students* has been a trusted guide. It now appears in its fifth edition, which has been revised and brought up-to-date (Edward Arnold and Co., 3 volumes, 18s. per volume). The first volume (pp.427) deals with "Reactions," the second (pp.487) with "Structure," and the third (pp.440) with "Synthesis." Among the matters finding a place in this new edition are: the electronic or polar theories of chemical combination (especially in regard to substitution in the aromatic series); new work on the Walden inversion; the stereochemistry of the hydroaromatic compounds; new optically active organo-metallic and non-metallic elements; the "parachor"; the structure of the sugars in the light of recent work; and recent researches on the nature and constitution of the polysaccharides and sesquiterpenes. This well-written work has long been regarded as a standard treatise, and in its present up-to-date form will no doubt be as popular as ever.

Developments in the Heavy Chemical Industry

By Lieut.-Colonel G. P. Pollitt

We publish below the full text of the paper on recent developments in the British heavy chemical industry, presented by Lieut.-ColonelG. P. Pollitt, a director of Imperial Chemical Industries, Ltd, in charge of the nitrogen fixation works at Billingham-on-Tees, at the closing session on Tuesday, May 15, of the Chemical Industry Conference in London.

We are at the beginning of a period of replacement of natural products by products made by synthetic and partially synthetic processes, and our industry is peculiarly to the forefront of this development. As far as I know there is no satisfactory definition of a heavy chemical, though most of us have a more or less vague idea as to what is meant. In practice the industry has been closely associated with alkali manufacture, and many of its products grew out of the old Le Blanc method of making alkali. Thus it was this process which led to the manufacture of sulphuric acid, saltcake, hydrochloric acid, and chlorine products generally on a large scale. The principal raw materials were coal, salt, limestone, and sulphur, and the industry had a tendency to concentrate at those points where these were readily obtainable. The Le Blanc process itself was born during the French Revolution, when France was unable to obtain supplies of alkali, and for all practical purposes it finally died in the great war. Costs of labour had become so high that it would no longer compete with the ammonia-soda and electrolytic processes for ash and chlorine products, but many of its ancillary processes continue in operation. The product which led chiefly to the wide ramifications of the industry was sulphuric acid, which until recently was an essential raw material for an immense number of other products. Practically all industrial acids were made by its means, and the more important artificial fertilisers, viz., superphosphate and ammonium sulphate, consumed very large quantities. Indeed, it might be said with a fair degree of accuracy that, apart from ammonia, soda, and chlorine, a heavy chemical manufacturer was one who made or used sulphuric acid on a large scale. This condition of affairs is rapidly changing.

Lieut.-Colonel G. P. Pollitt.

Signs of Change Before the War

Signs of the great changes that have come over the heavy chemical industry were not wanting before the outbreak of the war. The production of artificial nitrogen fertilisers by the arc process and the cyanamide process were well established in countries with supplies of cheap power, but the process was not economical for countries depending on power from coal, and it was not until the synthesis of ammonia from air, steam and coke had been developed that nitrogen fixation became possible for countries dependent on coal for their supplies of energy. This process and the production of nitric acid from ammonia was worked out in Germany before the war, and was enormously stimulated in that country during the war as large amounts of ammonia and nitric acid were required for munitions, and not the least of the triumphs of the German chemical industry is the energy and skill with which it has adapted itself to peace time conditions. In the old days the end of a war called for the beating of swords into ploughshares. In these, there is a striking analogy in the beating of explosives into fertilisers, but we have an advantage in that chemical processes are so flexible that the change over is a very much easier one. This difference is clearly seen in the relative speed with which the chemical industry has overcome its post-war difficulties as compared with the iron and steel trade.

Effects of the War

The effect of the war on chemical manufacture generally has been so great that it may be said to represent a fairly clear-cut division between pre-war and post-war practice, and it may be well to summarise the principal differences.

In the first place, all countries were brought to realise during the war the extent to which they depended on others for many essential commodities. This applied to the Central Powers, who were largely deprived of imports, as well as to the Allied Powers, who found themselves in grave difficulties over supplies of food and raw materials owing to the demand for tonnage, as well as over many chemical products which were not produced by themselves. The natural consequence of the troubles created by this disturbance of trade was that a desire grew up in most industrial countries to become self-supporting in as many essentials of life as possible, and more particularly in those which had a direct bearing on national safety.

In the second place, invention was stimulated to an unprecedented extent. The chemical industry in many countries (Germany is perhaps an exception) had gone ahead slowly, improving existing processes and finding new ways of meeting old difficulties, but had not had to set itself to produce entirely new processes at short notice. This necessity, combined with the freedom to spend money lavishly where necessary, showed chemists that they could tackle large new problems with good hope of success, and has led to a new attitude of mind towards chemical industry generally.

Thirdly, the development of synthetic processes, in itself a consequence of the desire for independence of foreign resources of supply, has introduced a new technique into the industry. The use of catalysts was confined to two or three processes only before the war, and the use of high pressures was practically unknown outside Germany. The range of products that can be made by means of this new technique is already considerable, but there is no doubt that as yet we are only at the beginning of what may ultimately be achieved.

Sir Alexander Gibb's Paper

Fourthly, there is a factor to which attention has recently been drawn in the presidential address by Sir Alexander Gibb to the Institution of Chemical Engineers in a paper on "Economics of power as applied to chemical engineering." The importance of power to the heavy chemical industries can hardly be exaggerated, and the paper referred to brings out some very interesting and important points. Before the war some of the power costs in hydro-electric stations were extraordinarily low, and power generated from coal had no hope of competing. This condition of affairs no longer obtains to anything like the same extent, and so far as new stations are concerned a country with cheap coal can expect to hold its own against a water-power country.

I do not propose to enlarge upon this question which has been so ably treated already, and will therefore only state the principal reasons for the changed conditions. These are, first, that most of the accessible sites which could be cheaply developed on a large scale have already been exploited, and, second, that the efficiency of steam generating stations has been and is still being enormously improved. No such improvement is possible with water power for the simple reason that these stations even in the early stages were not far from theoretical efficiency, whereas the possibilities of improvement with steam are still very great. The importance of these changed conditions to this country is obvious.

Fifthly, the new methods mentioned have tended to encourage large scale working at the expense of the smaller manufacturer. This tendency is not new in the heavy chemical industry. The ammonia-soda process is a long standing ex-

ample of a manufacture that can only succeed on a large scale, and the new processes mentioned illustrate the necessity for a large organisation even more clearly. Success depends on a number of technical considerations both in operation and research which can only be successfully dealt with by a large staff of trained men, many of whom are specialists in a particular branch of their subject. It would not be possible for a small manufacturer to employ the necessary number of chemists, physicists, and engineers to cover the field, and many of the processes themselves are such that large scale working is the only hope of getting down to low costs. These remarks only cover the technical side of the question, but naturally great financial strength is necessary, and only a large and efficient selling organisation can hope to dispose of the vast quantities of materials that are produced.

The need for large scale working is to some extent in opposition to the tendency for individual countries to encourage their own manufactures and a certain amount of give and take is required. In general it is not worth while considering the erection of local factories for the production of, say, fertilisers until there is an assured home market for a sufficient tonnage to justify a separate works, and it seems probable that the erection and working of such factories should be supervised by one of the large scale manufacturers who have an adequate research organisation behind them. The preliminary testing of the market, research into the best types of fertilisers for the particular conditions of the country, and the education of the farmer are best carried out by means of imports. As soon as it is clear what is wanted and how much material can be usefully applied to the soil, the question of a local factory can profitably be considered. But the new processes are so expensive in capital costs that the greatest care should be exercised in deciding on the size and design of a plant before going in for the large expenditure involved.

In all industries there is a general tendency for prices to approach the cost of production by the most efficient methods plus a reasonable margin of profit, and it is to the ultimate benefit of consumers that manufacturers should have every facility for reducing their costs to the lowest possible level. This can only be done by large expenditure on research and by intelligent choice of the most suitable points of manufacture for economic delivery.

Recent Outstanding Developments

Having dealt in general terms with the development of the industry, I should like to mention some of its recent outstanding developments. The first main group may be taken to include those processes which depend on high pressures such as the synthesis of ammonia already mentioned and the production of methanol and other alcohols which in a sense grew out of it. In this group also comes the hydrogenation of coal, which requires a somewhat similar technique. All these processes have something in common. They require high pressures and large supplies of cheap hydrogen, and the history of their development is most instructive. The synthesis of ammonia arose out of a " pure " research by Professor Haber on equilibrium. It appealed to the Germans, particularly as it held out the possibility of being independent of imports of nitrogen, which in war was a prime necessity.

The growth of the synthetic nitrogen industry has been phenomenal. Expressed in tons of 100 per cent. N, it has increased from some 50,000 tons in 1913 to about 850,000 in 1927. Hydrogenation of coal also started as a pure research by Bergius on the composition of coal, and it is probable that its adoption on a large scale would have been very much delayed had it not been that many of the problems involved had already been solved in connection with ammonia synthesis. This made it possible for the exploiters of the process to begin their work knowing that the production of hydrogen and the difficulty of working at high pressures need not be considered, and they could concentrate on the main problem of finding the right conditions to get good results with various grades of coal.

Oil from Coal

It is not possible yet to say what the future of the oil from coal industry will be, but as it makes it possible for coal-producing countries to become independent of oil imports, and as the reserves of coal are far greater than those of oil at present in sight, it is likely that very great efforts will continue to be made to put it on an economic basis, and I personally am convinced that we are not far from a commercial solution of this problem.

The second main group may be called the cellulose industries. Apart from paper, cellulose did not enter into the chemical industries before the war. Beginnings had been made with nitrated compounds for explosives, and the artificial silk industry was engaged in its early struggles, but there were few signs of the magnitude of present developments. The artificial silk industry, and particularly the viscose process, which is at present by far the most important, arose as a direct consequence of the work of Cross and Bevan on cellulose. This constitutes another instance of " pure " research leading to immense industrial developments.

The production figures of this industry are comparable with those for nitrogen. In 1913 13,000 tons of artificial silk were produced; in 1927, approximately 135,000 tons. In this industry Great Britain both in research and commercial development has led the world.

Nitrated cellulose has found entirely new uses quite outside the production of explosives. America is responsible for this development and the production by it of nitrocellulose lacquers and leather cloth is having a profound effect on the motor-car industry. The speed with which a brilliant finish can be given to motor car bodies and the hardness of the lacquer which renders it relatively free from scratching, have helped the motor-car industry to produce a more satisfactory product at low prices and the production of leather cloth has not only cheapened upholstery but has made possible the new fabric bodies which are rapidly coming into popularity. The use of these products is not, of course, confined to the motor industry and I mention it as it has so far been the principal user.

Cellulose acetate furnishes another example of the conversion of a process developed for war purposes to a great industry in peace. Cellulose acetate came into prominence as a dope for aeroplanes and after the war the use for this purpose almost entirely vanished. Efforts were at once made to adapt the product to artificial silk making and many difficulties had to be surmounted before a successful process was discovered. The main problems have now been solved and this type of silk appears to have a great future before it.

A Miscellaneous Group

The third group is miscellaneous. In it may be included the numerous products known as synthetic resins of which bakelite made from formaldehyde and phenol may be taken as an example. The resins have themselves been known for a long time but it was not till Baekeland in America succeeded in turning laboratory processes to works practice that the industry became important. A great many different kinds are now produced and many uses have been found for them and it is likely that the industry will develop rapidly.

Acetic acid originally derived from wood distillation and fermentation is now being made in increasing quantities by the catalytic oxidation of acetylene obtained from carbide or methane. The process is at work on a large scale in Canada and is being developed in other countries. In view of the increase in demand for acetate silk, this is a matter of importance, and this country is particularly suited for its development in view of the large quantities of methane it has available.

The manufacture of sulphuric acid has also undergone changes. The first of these is the increased demand for high strength acid which has tended to favour the contact process against the older chamber processes. The second is the discovery of a new source of sulphur. Before the war, pyrites, mostly fron Spain, and rock sulphur from Sicily or America were the principal sources and were supplemented by spent oxide from gas works. Under the stimulus of war the Germans developed the use of calcium sulphate, obtaining cement as a by-product. As calcium sulphate, either as gypsum or anhydrite is much more widely distributed than pyrites or sulphur, this will tend to make industrial countries less dependent on imports for their supplies of sulphur.

Chemical Substitutes for Raw Materials

The few instances of modern developments to which I have drawn attention seems to me to bring out clearly the changes that are taking place in the industry and the way they have come about. As a result of a great deal of pure and applied research we are gaining more and more control over the

resources of the world and are far less dependent on any special raw materials than we were. Chemical products are becoming of increasing importance as compared with natural products, either by providing substitutes or synthetic equivalents at lower prices. All these new processes call continually for more and more research. We now use pressure up to a few hundred atmospheres and we may want to use them in the future up to a few thousand. At present we know very little about the common properties of gases at these high pressures and accurate measurements of specific heats, viscosities, etc., are required. The behaviour of the metals of which we make our plants, when subjected to prolonged strain at high temperatures, affords a wide field for the investigator. And no one will, I think, claim that our knowledge of catalysis is more than elementary. Some day a theory of catalysis may be enunciated which will enable us to predict the chemical and physical properties of a catalyst for any particular synthesis, but that day is not yet in sight. That the kind of research mentioned may bring other results in its train is clear from the history of synthetic ammonia and artificial silk, but this is not as a rule the motive which leads to the work being well done.

Back to the Soil

In conclusion I should like to say that of the recent advances in chemical technology by far the most important appears to me to be the greatly increased production of fertilisers. The following quotation is taken from Stalky's reminiscences recently published:—"We are distracted by the unreal importance of events that are in themselves superficial and transient. The minds of cultivated and intelligent people are almost entirely absorbed in questions of science, art, commerce and politics, which are matters of quite secondary importance. The great matter for the world is the tilling of the soil, and it is the peasant that truly represents the race. Assuming the world's population to be 1,800,000,000, the tillers of the soil probably represent something over 1,400,000,000 and it is they who constitute the world."

The moral of this is clear. The whole world is interested in food, all of us as consumers and by far the most of us in production as well, and the stimulus given to agriculture by the production of cheap and abundant fertilisers and perhaps even more by intensive study of the needs of the soil which this production has brought about, is bound to have an immense effect on the world's principal occupation. If an industry is to be judged by the service it renders to the community, the heavy chemical industry can justly claim that it has not been found wanting.

Great Britain was for many years the chief manufacturing nation of the world in all the heavy industries. She has, to some extent, lost this position and largely owing, I think, to her adherence to small individual units with their more limited outlook and necessarily smaller resources in money and men. She remains, however, blessed with natural conditions second to no other manufacturing country. Her highly trained labour, her brilliant engineers and chemists, her exceptional advantages as to cheap raw materials, her ready access to the best shipping facilities—she still has. If she has fallen behind in some fields, it is because of her failing to grasp as quickly as some of her competitors the possibilities offered by the application of science to industry. As soon as her industrial leaders understand and act upon this obvious fact she will again take her place as the chief factor in the export trade of the world. (Applause.)

The conference closed with votes of thanks to Colonel Pollitt, to the organisers, and to the Institution of Civil Engineers for the loan of their building.

The Nova Scotia Gypsum Industry

THE Province of Nova Scotia is rapidly coming to the front as a producer of gypsum, the output having reached 850,000 tons during the twelve months ended September 30, 1927, an increase of 40 per cent. over the previous year's tonnage. This output represents 78 per cent. of the total output of gypsum in the Dominion of Canada. Of this amount, 11,000 tons were calcined in Nova Scotia, while the remainder was shipped in the crude form to Montreal, and to points in the United States. Indications point to a further increase in gypsum output during the coming year.

Trade Unionism and Registration

To the Editor of THE CHEMICAL AGE.

SIR,—In the discussion which arose at the annual meeting of the London Section of this Association regarding the advisability or not of cancelling the Association's registration as a trade union and incorporating the society, some very interesting points were raised by both sides. There was one, moreover, which was advanced but not developed, and which it is of interest to discuss.

The speaker defending trade union registration contended that, neglecting illegitmate activities which need not and ought not to colour trade union procedure, it encouraged *esprit de corps*, a characteristic admittedly not strongly developed in the profession of chemistry. It could not be asserted that societies other than trade unions are necessarily deficient in this direction, but it remains true that trade unionism does owe most of its legitimate success to the fostering of this spirit.

A conclusion even more important is reached when it is considered that, like the mediæval guild, trade unionism aims at the greatest efficiency of the greatest number, and those who contend that its intention has been to place a premium upon inefficiency are clearly incapable of an impartial view. Modern industrial conditions have made it necessary that large numbers of individuals trained in a particular way shall be available, and if the trade unions have not always insisted upon the maximum efficiency, they have at least ensured that large numbers of a satisfactory standard shall be available at all times. It may be soundly stated, in fact, that in the skilled trades the unions have made collective efficiency an accomplished fact. No political issue is involved in this assertion. Facismo, as much as Labour, clearly recognises the principle.

The profession of chemistry may, with profit, consider the matter in this light. The trade unions have, in fact, produced close occupations because they have encouraged *esprit de corps* and, in principle at least, collective efficiency. The Association, with these principles in mind, adopted trade union registration, believing that out of it would rise the larger scheme of legalised registration which we believe is appreciably nearer.

It is necessary again to insist that, being ineligible for affiliation to the Trade Union Congress, the Association is not committed to the ordinary trade union procedure, but bearing the foregoing argument in mind, it is obvious that there is much to be said for the professional type of trade unionism the Association represents.

This is not to say that the time has not arrived carefully to review the situation and to decide if a change is desirable, but in any case it must be one which will do no violence to *esprit de corps*, and the ideal of a high standard of collective efficiency.—I am, etc.,

HENRY T. F. RHODES,
General Secretary,
BRITISH ASSOCIATION OF CHEMISTS.

175, Piccadilly,
London, W.1.

John Benn Hostel Ballot

READERS of THE CHEMICAL AGE who have taken an interest in the work of the East End Hostels Association and the John Benn Hostel will no doubt be glad to hear of new activities which will enable them to enter into close contact with the institution. That the lines on which the hostel is run are sound and that this endeavour to help East End boys is known and appreciated is demonstrated by the widespread interest of the public and by the fact that the Prince of Wales has paid the hostel the compliment of two visits in a single year, but the stumbling block to continued progress is finance. A good deal of money is needed and an effort is to be made this year to cope with the problem by launching a National Ballot.

Sir Ernest Benn will be glad to hear from any of our readers who are willing to give prizes for the ballot, and also from those willing to help the cause by selling tickets. Many prizes have already been promised, but it is hoped that the list will be increased.

The value of the gifts should be stated. Each prize must be taken as allocated and therefore donors will not be troubled with requests to exchange gifts for others. In connection with the ballot fifty thousand leaflets, cards, etc., are being printed, giving particulars of the prizes. Any gifts, from a house or a motor car to boxes of soap, will be received gratefully.

The Budget and the Petrol Duty

Effects on Dyestuffs Manufacture

A MATTER of considerable interest to those in this country engaged in intermediate and dyestuffs manufacture is the effect (a correspondent writes) the new Budget duty on imported petroleum oils will have on their efforts, so far blessed with some little success, to gain a profitable share of overseas trade. Whether the Chancellor of the Exchequer, when he designed the duty and proclaimed it as a boon to the Scottish shale oil industry, was conscious of the boon he was at the same time bestowing upon those British collieries possessing by-product plants and to other benzol producers is not obvious, but it is obvious that such collieries—and these days the collieries undoubtedly require all the help available—and the National Benzole Co. have much (an increase of 4d. per gallon) to be grateful to the Chancellor for. On the other hand, firms engaged principally in the manufacture of spirits and intermediates produced from crude benzol, find themselves saddled with a burden of 4d. a gallon on their essential raw product, and this is additional to the handicap, in the competition for world markets, of higher labour costs and heavier taxation as compared with Germany, France, Italy, and Switzerland. The American labour costs are no lower than ours, but their goods have not to bear the burden of taxation that those of British manufacture must. Moreover, all the countries named have supplies of benzol which are cheap, even when compared with our supply before the jump of fourpence per gallon consequent upon the Budget.

Proposed Drawback on Benzol

The industry feels that in the present crisis it should have some nurture treatment to help to maintain and increase its export trade, but the question is the form of treatment. Great Britain is said to be importing about as much benzol as she is producing, and consuming about 5 per cent. of her own production for dyestuffs. The Chancellor was quite out of sympathy with the oil cake makers of Hull who applied for preferential treatment with regard to imported oil, pointing out to them that the slight increase in the finished material did not warrant such treatment. Benzol is the life blood of the intermediate and dyestuffs industry, and 4d. per gallon makes a big difference to the cost of manufacture of intermediates, which is passed in turn to the dyestuffs. Perhaps with this fact in view, the Chancellor would be disposed more sympathetically towards our trade than he was towards that of the oil cake makers, and grant a drawback on material made with the aid of duty-paid benzol or alternatively arrange to issue it ex-bond free of duty. Perhaps if sufficient pressure were brought to bear on the Chancellor to cause him to consider our great need, the National Benzole Co. might be brought to regard our industry more tenderly than they appear to do at present. Thus, one of the questions on the manufacturing side with regard to export would be disposed of.

On the commercial side we have that of payment for our goods and credit. Pre-war, quarterly accounts were the rule rather than the exception, but now, under-capitalised and overtaxed as this industry of ours is to-day, such credit cannot be provided, yet terms of ninety days are frequently met with on the Continent, such being granted by the German producers, and whilst some of the continental importers are ready to pay us net cash against documents, there are countries which are totally unable to do so. Poland is one. In that country it is no uncommon thing to be asked for six months' credit, and the Germans appear to be quite willing to grant it. To compete, we must be prepared to do the same, and it is here our Government came to our aid in a very practical way.

Export Credits

The Overseas Trade Department of the Board of Trade contains the officially designated "Export Credits Guarantee Department," functioning to help the British exporter who will accept overseas orders from certain prospective customers, subject to the assistance of that department. He submits the names and addresses of his clients, and the Department initiates its own inquiries as to their status. After status information has been obtained regarding the importer, the actual percentage of risk to be assumed by the Department is decided upon, but in no case is the maximum of 75 per cent. exceeded. The exporter is required by the Department to pay a premium which varies with different factors, and particularly with the status of the buyers and the percentage of risk assumed by the Department.

The following example is given to give roughly an idea of the rate of premium :—If the department accepted 50 per cent. of the risk of a bill drawn at six months on a buyer in Poland, the premium charged would probably be in the neighbourhood of 2 per cent. on the face value of the bill (*i.e.*, the charge for guaranteeing £50 on a bill of £100 would be £2). If the length of credit was three months only, the rate would be proportionately reduced. Similarly, the rate would be increased if a greater percentage of the risk was accepted by the Department. Guarantees may be given for all markets except, at present, Russia. The Department invites direct discussion, but the formal application should be made through a bank. The use of these facilities is rapidly increasing, so much so that the Department found it necessary, at the commencement of the present year, to move into larger premises.

It has been said recently in public by Sir Robert Horne that manufacturing in quantity reduces the cost of every unit of production, and the larger the market the cheaper the price. The writer ventures to say that no manufacturer will contradict the statement, hence the importance of expansion of overseas trade, for which both self help and Government help are required.

Chemical Patents

Comptroller-General's Remarks on Expansion

THE forty-fifth report of the Comptroller-General of Patents, Designs, and Trade Marks, for the year 1927, has just been issued (H.M. Stationery Office, pp. 22, 6d.). With regard to the trend of post-war invention, the Comptroller states that "in the period since the war, the greatest inventive activity is to be found in the chemical industries. The increase has been most marked in the domain of applied organic chemistry and especially in the manufacture of dyestuffs, such as azo and anthraquinone dyes, the manufacture of synthetic drugs and the catalytic syntheses of methyl alcohols, etc. Inventions relating to the manufacture and dyeing of artificial silk have been the subject of a large and increasing number of applications, and the utilisation of the product is reflected in many inventions directed to knitting, spinning and weaving machinery, and the finishing of fabrics.

"There has been much invention in connection with activated carbon for use in gas adsorption and decolourising sugar, etc. In connection with the rubber industry, the most striking developments are in the concentration and vulcanisation of latex, the use of low-temperature vulcanisation, the electrophoretic deposition of coherent indiarubber articles from latex, and the adoption of spray drying for obtaining rubber direct from the latex; methods of preventing ageing of indiarubber are also attracting attention. The most remarkable features of metallurgical inventions are the improvements in stainless iron and steel and the production of alloys having special magnetic properties.

"Invention is active in connection with the production and economic use of fuels. The preparation of liquid fuels, such as motor spirit, by the destructive hydrogenation of coal under conditions of high pressure and temperature is a recent development. Advance is also being made in the low-temperature carbonisation of coal, whereby a free-burning, smokeless fuel of high calorific value is obtained with a high yield of light and heavy oils as by-products."

Typical specimens were furnished in connection with applications in respect of chemical inventions in 14 cases, 56 sample bottles and 31 dyed or printed specimens being filed.

Newcastle Paint and Colour Maker's Affairs

UNSECURED liabilities of £94,287, and an estimated deficiency of £21,791, were disclosed by the statement of affairs laid before a meeting, this week, of creditors in W. H. Holmes and Sons, paint and colour manufacturers, Newcastle. The partners, Alfred Holmes, John Henry Holmes, Ellwood Holmes and Stephen Holmes, who also carry on business at Newcastle-upon-Tyne as electrical engineers, have executed a deed of assignment for the benefit of their creditors to two members of the firm of Joseph Miller and Co., chartered accountants, of Newcastle. The assets include stock in trade and work in progress valued at £40,000, and debtors estimated to produce £24,000.

Preparing Shipments to South America

The Avoidance of Delays and Penalties

The following notes are based on extracts from a handbook, "Preparing Shipments to Latin America," which is published by the United States Bureau of Foreign and Domestic Commerce, and will, no doubt, be of assistance to exporters not only to South America but to other parts of the world.

THE exporter too frequently experiences vexatious delays or costly penalties in the clearance of his goods at their destination, because of failure to anticipate the exact conditions of doing business with the given country, or the lack of full information as to the procedures and regulations of foreign countries regarding the proper preparation of shipments, the handling of shipping documents, the consular requirements in this country, and the conditions of entry at the destination. There is a gradually increasing trade, in some branches of chemical industry, between this country and South America, although the United States, owing to its proximity, and Germany are competitors in the market, and it is therefore necessary that goods should be delayed as little as possible at their destination if the goodwill of the importer is to be retained.

In part, these unfortunate experiences are attributable to the complex and exacting consular and customs regulations of various countries, and confusing lack of uniformity in their requirements and practices. It must be admitted, however, that these unpleasant "surprises" are in part due to the fact that the business of getting goods into foreign markets is too often regarded by many firms as a routine matter, and too frequently is delegated to a minor employee who does not always have the special knowledge necessary to plan and dispatch an export shipment so as to ensure its safe and prompt arrival. The more enlightened export managers are now coming to realise the necessity of themselves keeping informed on the detailed conditions of making shipments to the various countries, and of seeing to it that full and up-to-date information is regularly available inside their own organisation.

Labels, Measures and Packing

The first essential in the preparation of a shipment is an understanding of the requirements of the country of destination with regard to marking or labelling of goods. The requirement for origin marking on goods is not as yet general in Latin America or the West Indies, but a number of the Latin American Republics do insist that the statement of quantity or contents on the labels of packages be given in units of the metric system. This requirement can usually be satisfied by affixing an additional label bearing the metric equivalent. The Argentine requires an indication of the country of origin, of the nature of the product, and on some goods a statement of the quality or component materials. The new Cuban tariff requires an indication of origin on a few specified products only. Where they do exist, it is necessary to know these requirements before the goods are packed, if delays and possible penalties are to be avoided.

Most countries of Latin America have tariffs made up almost entirely of specific duties—so much per unit of weight or quantity. These duties are assessed in many countries upon either the gross weight, which includes even the external casing or baling, or upon the varying bases known as "legal" weight, usually meaning the weight of the goods plus that of the immediate container. It is therefore well to know the exact basis of duty assessment in the country to which the goods are shipped when preparing them for export. It may be found advisable to lighten the cartons or outer containers or even to ship the goods themselves in the very lightest wrappings consistent with safety and have the wrappers and other containers shipped separately and pay the lower duty applicable to them as manufactures of wood, paper, tin, or the like. This, of course, cannot be done with chemicals of a hygroscopic nature.

Certain Latin American countries prohibit shipment in the same package of merchandise dutiable at different rates, unless the package is accompanied by a full itemisation of its contents.

Meeting Foreign Documentary Requirements

Most foreign countries require that goods be accompanied by special documents, such as consular invoices and certificates of origin, and usually that these be certified by a consul of the country of destination. In shipping to the countries of Latin America particular care must be taken to fill in these documents in such a way as to avoid possible delays or fines upon arrival at the port of destination. Failure to observe this strict care in preparing shipping documents is a most prolific source of difficulties.

The point of greatest importance in making out shipping documents is the description of goods on the consular invoice. The requirements of many Latin American countries in this respect are very strict. Even a full commercial description in the current designation of the trade, which should appear on all invoices, is not entirely acceptable in all cases. Some countries require an indication of component materials; and some require declaration of goods in the actual phraseology of the tariff, a few even insisting on the indication of the item number of their own tariff schedule. Failure to describe goods precisely in accordance with these requirements makes the shipment liable to heavy penalties.

Second only to the description of the goods as a pitfall in export documentation, is the declaration of weight. Despite the efforts to bring about standardisation, the American countries are a long way from uniformity in the definition of what constitutes net weight or legal weight.

Penalties for Irregularities

Errors or irregularities on consular invoices or other export documents prescribed by the receiving country make the shipment liable to penalties ranging from a nominal fine to double the duties, and even seizure of the goods. Penalties are usually exacted regardless of whether the error is intentional or not, and fines are seldom refunded.

Consular Fees

Nearly all the American Republics require that the invoice or other documents be presented to the consul of the country for certification. The fees for this service vary widely, some countries charging a fixed amount, others a percentage of the invoice value of the shipment. On shipments to several countries this *ad valorem* consular fee is collected from the consignee in the country of destination, either wholly or in part. The tendency toward collection of consular fees at destination appears to be growing.

Entry and Warehousing

It is also of vital importance to the exporter to be familiar with the regulations of the country of destination with regard to the treatment of goods upon arrival. It is important for him to know the time allowed for presentation of documents and clearance through the customs; the provisions for effecting reconsignment of a shipment to another market, or re-exportation to the port of origin, in cases where delivery at the first destination is not possible or practicable; and the regulations of each country covering storage of goods in customs warehouses, provisions for the examination of goods in warehouse, and the like. A knowledge of conditions and warehousing is a useful aid when packing goods.

Conditions for entering travellers' samples should receive attention, as what are defined as samples of commercial value and samples of no commercial value vary widely, as also do regulations covering the entry of samples carried by salesmen. The conditions of shipment by letter or parcels post of small goods is another stumbling block, and the method is by no means desirable in all cases. A point well worth noting is the degree of purity of shipments, as in some cases, to afford protection for domestic refineries, chemicals of too high a standard of purity may be refused entrance, whereas a less pure article, to be refined in the country of destination, may be admitted.

Canada as a Market

Some Outspoken Comments

An editorial article dealing with the marketing of chemicals and chemical plant in Canada, which deals with the subject in a very frank manner, has just appeared in "Canadian Chemistry and Metallurgy." While the article does not make the most pleasant of reading, it is sufficiently important to merit reproduction, in order that manufacturers and others in this country may see the situation as viewed through Canadian eyes.

In the marketing of chemicals and chemical plant not produced in Canada, those who seek to cultivate business should realise that most of the general rules surrounding export trade hold. Canada has used, for the most part, American-made chemical equipment. Important exceptions may be pointed out, but on the whole it has been very difficult for European firms to meet the situation. Indeed, the amount of American-made and designed plant offered for sale in Europe has shown a remarkable increase. The situation is much more balanced on the chemical side.

The American Position

The apparent attitude of many American manufacturers is to consider Canada as just one more state. It is assumed that Canadian business is merely American business with a few regulations that make the price to the buyer higher than the American price. Doing business in Canada is a very mild type of exporting. The principal thought that brings amazement to most American manufacturers of chemical plant is the fact that Canadians are foolish enough to tax themselves on equipment which is only manufactured even in the United States in a relatively small way by one or two firms. The American mind can appreciate protection to the limit if there is anything to protect, but the idea of charging yourself just for the fun of it does seem rather amazing. Our remarkable tariff which tends to Free Trade in things we manufacture, and Protection on many items not manufactured, is beyond the understanding of any foreign country and a bit beyond the comprehension of many Canadians. Protection to induce manufacturing is a good theory, but it needs some watching if absurdities are to be avoided.

Chemicals in Canada are in a much better position from the standpoint of the consumer. Dyestuffs enter free, and colour-users have had all the producers in the world offering their best products at rock-bottom prices. We should be receiving well-dyed fabrics from Canadian mills and we are, to a greater extent than the public appreciates.

European Imports via the United States

As yet we do too much business with European and Eastern countries by way of American ports. The New York market continues to impress certain buyers who really have no business looking in that direction at all. With the United States tariff altering certain chemical prices to the point where they can hardly be recognised when compared with world prices, attention should be directed more to fair Canadian prices based on direct importation. So many well-organised firms of Canadian distributors and agents are now at the service of buyers that orders for all requirements can be placed with Canadian houses. We know of no chemical item which cannot be procured, over a period of time, through a Canadian dealer, with less trouble and at no greater cost than is connected with sending the order abroad. Great has been the grief of some chemical users who improved their education by accepting distressed goods of second quality at a small fraction off the regular price on the strength of a wire or letter from some house abroad.

The chemical market in Canada is better served and better understood because more Canadian organisations of some size serve it. On the machinery and plant side, that development is coming. To some extent, chemical plant is handled by firms whose chemical engineering or appreciation of the process industries is very weak. In other cases, very competent representatives have built up close personal connections with the market. Their sales show this.

A very slightly increased market for chemical equipment in Canada is bound to compel the establishment of sales staffs capable of something more than order-taking. Wherever possible, European and American companies should arrange with competent Canadian companies for the manufacture in Canada, in whole or in part, of the equipment they may wish to sell here. Several larger engineering and manufacturing organisations are most anxious to cultivate such business. Usually sales are aided by this means and a much stronger position in the market may be secured. Foreign manufacturers of chemical plant should at least have first-hand knowledge of the facilities offered by Canadian foundries and the larger machine works.

Production of Dyestuffs in 1927

Main Classes of British Output

The Board of Trade have combined the following statement showing the quantities of the various main classes of dyes which were produced in the United Kingdom during the year 1927. The statement has been prepared from returns furnished voluntarily by the principal British dye makers, and, though it is not quite comprehensive, the combined output of the firms which did not make returns was negligible. The figures in all classes represent the production in market types.

Category.	Blacks. Lbs.	Blues. Lbs.	Browns. Lbs.	Greens. Lbs.	Oranges. Lbs.
Direct Cotton Colours	2,172,380	1,011,853	421,657	143,393	275,661
Acid Wool Colours	1,438,631	1,316,987	104,029	294,875	500,919
Chrome and Mordant Colours (including Alizarine)	1,468,434	760,317	530,230	107,351	661,965
Basic Colours	7,570	337,828	127,940	171,888	122,537
Sulphur Colours	5,396,527	295,967	993,086	196,020	31,902
Vat Colours (including Indigo)	166,434	7,600,418	30,557	141,207	127,446
Dyestuffs for Lake Making	—	—	—	76,187	387
Oil, Spirit and Wax Colours and Miscellaneous	409,937	414,641	71,495	5,262	62,805
Aggregate Total	11,059,913	11,738,011	2,278,994	1,136,183	1,783,622

Category.	Reds. Lbs.	Violets. Lbs.	Yellows. Lbs.	Total. Lbs.
Direct Cotton Colours	720,807	75,130	794,726	5,615,607
Acid Wool Colours	1,339,846	478,900	758,992	6,233,179
Chrome and Mordant Colour (including Alizarine)	3,535,926	50,189	387,817	7,502,229
Basic Colours	450,828	451,671	344,544	2,014,806
Sulphur Colours	104,837	—	98,894	7,117,233
Vat Colours (including Indigo)	243,834	283,598	225,429	8,818,923
Dyestuffs for Lake Making	988,197	—	73,604	1,138,375
Oil, Spirit and Wax Colours and Miscellaneous	88,657	28,636	29,971	1,111,404
Aggregate Total	7,472,932	1,368,124	2,713,977	39,551,756

Synthetic Nitrogen Compounds

International Finance for German Project

In New York recently, Dillon Read and Co. offered for public subscription $4,000,000 (£819,000) twenty-year 6 per cent. mortgage bonds of the Ruhr Chemicals Corporation (Ruhrchemie A.G.), a company recently formed by 28 of the leading Ruhr colliery and steel interests to utilise the waste coke-oven gases of the Ruhr for the manufacture of synthetic nitrogen fertilisers. The bonds, which are a direct mortgage lien on the company's property, and are further secured by the assignment to trustees of two-thirds of the share capital (R.M. 27,000,000), are being offered at 92¼ to yield 6·71 per cent. to maturity. Part of the issue is to be placed in Amsterdam, Germany and Switzerland. Annual sinking fund payments of $211,000 (£42,000) will provide for the redemption of the bonds at par and interest. Proceeds of the issue will be used for financing part of the cost of the company's first producing unit.

The new company, whose stockholders, headed by the United Steel Works Corporation (Vereinigte Stahlwerke A.G.), include the Thyssen, Stinnes, Krupp and other important Ruhr concerns, controlling between them 70 per cent. of the coke-oven gas production of the Ruhr, will use the Concordia-Linde-Casale processes. Plant capable of producing annually 300,000 tons of synthetic nitrogen compounds is already under construction and the first unit at Holten near the Rhine will be ready early next year with an initial output of 16,100 tons.

The net profits for a normal year's working are estimated by the directors at $1,200,000 (£245,000), owing to the low cost of production under the new process; it is expected that the marketing of the company's fertilisers will have important repercussions on the nitrate industry generally. The present surplus of coke-oven gas in the Ruhr area is estimated at approximately 9,000 million cubic metres annually, and this is sufficient to cover the requirements of the Ruhr Chemicals Corporation more than ten times.

New Zealand as a Chemical Market

Conditions of Successful Trade

THE New Zealand demand for chemicals and chemical preparations is considerable, and although the market's requirements, particularly on the industrial side, are largely satisfied by Great Britain, opportunities still exist in many directions for British manufacturers to increase their trade. The agricultural, dairying, wool, and fruit-growing industries call for heavy supplies of disinfectants and fertilisers, whilst the rapid growth of local manufacturing industries, which include, among others, the production of woollens, clothing, leather, paint, varnish, soap, toilet, and medicinal preparations, ensures steady and increasing demand for many forms of chemicals. Competition from the U.S.A. and certain continental countries is becoming very keen in many instances, but this should be successfully overcome if serious efforts are made.

During 1926 the total importation of acids amounted to 902,943 lb. valued at £27,737, of which Great Britain supplied 320,676 lb. valued at £12,209. British manufacturers practically control the trade in carbolic and citric acids, but the largest proportion of the business in acetic acid, fluoric acid, and tartaric acid is in the hands of Canadian, Australian, and American manufacturers respectively. Italian competition is also keen in tartaric acid, whilst large quantities of sulphuric acid are obtained from Australia.

Ammonium Compounds and Dyes

The importation of ammonium compounds is not very large, supplies being mainly drawn from the United Kingdom, as are also sodium compounds, arsenic, chloride of lime, iodine, cyanide of potassium and soda, refined glycerine, and magnesium sulphate. Competition in these classes from foreign sources is not severe, but the demand is steadily increasing, and the business therefore warrants careful cultivation. A total quantity of 14,427 cwt. of calcium carbide was imported by New Zealand in 1926, Great Britain supplying 9,103 cwt. and Norway 3,651 cwt. America is the chief competitor in cream of tartar, imports from that source amounting to 470,968 lb. in 1926, compared with 895,796 lb. from the United Kingdom. Potassium salts are obtained mainly from the United Kingdom and Germany.

With regard to manufactured dyes, the United Kingdom is the leading supplier, followed by Germany, U.S.A., and Australia. The total imports in 1926 were valued at £45,489, Great Britain's share being £25,931, Germany's £7,107, and America's £4,471. The importation of German dyes is, however, increasing, and steps should be taken to counter this.

Toilet and Medicinal Preparations

There is a fair local production of toilet and medicinal preparations, but the output from domestic concerns is only sufficient to supply a very small proportion of the market's needs. The demand for imported goods is very large, and although British firms have secured a good share of the trade, supplies from America, Germany, and France reach considerable dimensions. Medicinal preparations and drugs, except barks and leaves, to the value of £309,459 were imported in 1926, whilst the corresponding figure for toilet preparations and perfumery was £149,808. Great Britain's share amounted to £173,038 and £75,963 respectively, and America's to £45,720 and £31,006.

Disinfectants and Insecticides

The wool-growing industry is responsible for an excellent market for disinfectants and sheep dips, requirements of which are chiefly imported from the United Kingdom, although Australia also exports fair quantities. The position with regard to insecticides so far as Great Britain is concerned, however, is not so satisfactory, as in many cases these preparations are being largely obtained from the U.S.A. During 1926 the total importation of insecticides and tree washes, excluding sheep dips, was valued at £17,441, of which no less than £12,005 represented the share of the U.S.A. Exports from Australia were worth £3,672 and from Great Britain £1,655. There undoubtedly exists a wide field for United Kingdom manufacturers in this branch of the business, and more serious efforts should be made to cultivate the market. Lime sulphur is being manufactured locally, although fair quantities are supplied by the U.S.A. and Australia. The trade in sulphur and arsenate of lead is almost an American monopoly, although the United Kingdom slightly increased her sales of the latter preparation in 1926. Nicotine preparations and calcium caseinate spreaders are also imported from America in very large quantities, but sulphate of copper is almost entirely supplied by Great Britain, whilst Belgium is a large supplier of Bordeaux mixture. Spraying mixtures are usually put up in small packets, arsenate of lead powder being offered in 25 lb. cartons, eight to a crate, and also in 5 lb. packets and bags of various sizes. Paste is supplied in 1, 2, 5 and 10 lb. tins, although the demand for this form is declining in favour of finely ground powder. Bordeaux mixture is imported in cases containing eight cartons of 25 lb. each, nicotine preparations in 10 lb. tins, and sulphur in 100 and 200 lb. kegs.

Artificial Fertilisers

New Zealand requires heavy supplies of artificial manures for the development of her agricultural and pastoral industries, and the demand for chemical fertilisers is, therefore, considerable. A very small share of this business is in the hands of British firms. Sulphate of ammonia is principally drawn from Australia, which supplied 917 tons in 1926 compared with 150 tons from the United Kingdom and 150 tons from the U.S.A. Nitrate of soda is entirely obtained from Chile, whilst Belgium exports the bulk of the basic slag required. 46,531 tons of the latter were imported into New Zealand in 1926, 33,431 tons being supplied by Belgium and 13,000 tons by the United Kingdom. Germany satisfies roughly 50 per cent. of the demand for sulphate of potash, the remainder being mainly obtained from France. These two countries also supply practically the whole of the other potash fertilisers required.

Conditions of Success

The New Zealand market undoubtedly offers excellent prospects for British chemical manufacturers to extend their business. Efficient representation, however, is essential, whilst personal visits of representatives in order to establish relations with agricultural, fruit-growing associations, etc., and other large importers, are strongly recommended. The questions of packing and advertising, especially with regard to toilet and medicinal preparations, are other vitally important details which should receive the greatest possible attention.

Sir A. Mond on Mergers

THE advantages of industrial amalgamation were referred to by Sir Alfred Mond, M.P., in an address prepared for the annual dinner, on Friday, May 18, of the Colston Research Society, Bristol. In the absence of Sir Alfred on urgent business matters, however, the paper was read by Dr. F. A. Freeth, F.R.S. Modern mergers (stated the address) were not made for the purposes of creating monopolies or for inflating prices, but for the purpose of realising the best economic results, which both capital and labour would share to the best advantage. They enabled varieties of industries to form an insurance against fluctuations of markets and prices in individual products. There were some people in this country who were afraid that Britain had not the capacity to organise and manage big units of industry. Sir Alfred's experience was that it was easier to manage big affairs than small ones. In a small business a mistake meant bankruptcy, but in a big business one could make mistakes and still come out all right at the end of the year. This country had one thing which did not exist in the same degree anywhere else, and that was the team spirit. In reference to the conditions under which great industrial discoveries were made, it was pointed out that artificial silk was an industry which had been foreseen many years ago, and which was only put into practice after a tremendous amount of hard work and failure. If research workers would investigate the work of their predecessors they would make substantially faster progress. There was a great deal of rediscovery to be made. The theory of Mendelism was one of the forgotten discoveries rediscovered by a later worker.

The Chemical Requirements of South America

Opportunities for British Manufacturers and Exporters

In the following article an attempt has been made to give some idea of the needs of the South American countries for chemicals, together with notes on internal production, foreign competition, and the existing standing of British manufacturers and exporters.

IMPORTS of chemicals, drugs, and dyes into Brazil appear to be diminishing, for the amount in 1926 reached a total of 38,440 tons, while in 1925 the total reached 67,418 tons and in 1924 57,892 tons. There appears to be a good market for dyestuffs, the value being about £200,000 yearly. The import duty being levied on the weight of the dye, importers demand concentrated dyestuffs, and, incidentally, have for many years been supplied with concentrated German dyes. German manufacturers send out dyes for stock and take upon themselves the payment of carriage and duty in Brazil, the cost of warehousing, and the risks of exchange and bad debts. Payment is not demanded from the agent until the goods are sold and the cash is received from the customer. Dyes are made on a small scale in Brazil from German raw material.

Britain still holds the lead in caustic soda and alkalies, but imports are not now so great as previously, for internal production is encouraged by the State. Imports of caustic soda amount to 150,000 tons yearly. Sulphuric, acetic, and tannic acids, caustic soda and bleaching powder are made internally, but sulphuric acid is still imported from Britain. There is also a trade in bleaching powder, as the domestic works are unable to supply the demand. Arsenic is mined locally. Calcium carbide is imported, but in dwindling quantities owing to production from a factory at Rio de Janeiro.

American Competition

Apart from German competition, the United States Government constantly urges the attention of American manufacturers to the market. There is, for instance, a trade with the United States in aluminium sulphate, boric, oxalic, formine and lactic acids, acetates, potassium compounds (bichromate, chlorate, permanganate and refined nitrate) ammonium chlorides and hydrogen peroxide. Soda ash, on the other hand, is largely imported from Great Britain. Sodium sulphide for tanning purposes is imported from foreign sources and sodium bisulphite from the United Kingdom. Of other sodium compounds, silicate is imported regularly, but sulphate imports are declining. As acetic acid is manufactured internally, lime acetate is imported for the purpose. Painters' materials are also in demand. Raw materials for toilet preparation are imported, there being a fairly good domestic production of such lines. Disinfectants and insecticides are as in all tropical countries, in good demand, and the United Kingdom has a good share of the trade.

Fertilisers

The consumption of fertilisers is not great, as there is so great an area of land available for agriculture. Chemical manures are imported to the extent of 12,000 tons, about six times as much as five years ago. Mixed fertilisers are made on a small scale and some Chilean nitrate is imported for the purpose. There are also small supplies of natural phosphate and sodium nitrate in Brazil. It is calculated that 100,000 tons of nitrogenous fertiliser and 200,000 tons of phosphates could be absorbed. To this end the Government is encouraging the establishment of a hydro-electric plant for the manufacture of the materials, and plants are to be established with an output of 75,000 tons of fertilisers. The biggest users are the coffee growers.

Other Markets

Mexico is a declining market for sulphuric acid owing to the increase in domestic production, which in 1926 amounted to about 30,000 tons, chiefly manufactured by oil companies from American sulphur. Creosote, coal tar, benzol and ammonium sulphate are produced by one coal company. There is, of course, a market for disinfectants and insecticides. These materials are also in demand in Guatemala, where the imports have increased threefold in a year, but even so the total amount is less than 100 tons. A number of chemicals for use in destroying agricultural pests are exempted from import duty.

There is a fairly large consumption of fertilisers in Cuba, this being in the neighbourhood of 130,000 tons a year. Raw materials for their manufacturers are generally imported. The sugar and tobacco growers are the chief users. The United States manufacturers hold a strong position in Cuba, but in some directions they are undersold by British and German makers.

In Ecuador there is a slightly growing trade in chemicals for soap works, tanneries, oil refineries and match making. Venezuela imports a small amount of artificial fertilisers. Insecticides in the form of sprays and powders are exempt from import duty. Costa Rica imports small amounts of artificial fertilisers.

Machinery for the Chilean Nitrate Industry

The use of labour-saving machinery in nitrate mining in Northern Chile has increased greatly of recent years, and the competition of synthetic nitrates has resulted in the evolution of new methods of production, necessitating new and improved machinery. The nitrate industry affords a new market for power shovels and similar lifting machinery. Northern Chile is an arid desert with a rocky surface full of ravines and dry river beds. In many places there are stretches of smooth ground covered by loose sand and rock in the nitrate areas. Caliche is found a few feet below the surface, often embedded in rocky material which requires blasting to be loosened. After blasting, the lumps require to be broken up before they can be loaded by hand on to trains. Caliche has been loaded by hand for years, owing to cheap labour, and only recently, owing to dearer labour and the breaking up of the Chilean nitrate monopoly, have power shovels and other power methods been introduced and found to be satisfactory. As caliche is found in pockets and not in veins the shovel must be easily moved from place to place and should be on caterpillars. An American concern has recently conducted tests with an excavating machine which cleans off the surface sand and material, and bares the nitrate beds preparatory to blasting. This method seems to have been successful for nitrate which is buried at a depth of three or four yards. In this branch of engineering British, German and Jugoslav firms have held most of the market, but the Americans are rapidly coming to the front and by actual demonstrations with plant are gaining a large number of orders.

U.S. Production of Graphite in 1927

WHILE the total production of graphite in the United States in 1927 was slightly less than that of 1926, its total value increased, according to a statement by the United States Bureau of Mines, Department of Commerce. The following statistics of production were collected in co-operation with the geological surveys of Alabama, Michigan and Texas. The sales of natural graphite by producers in 1927 were 5,207 short tons, valued at $232,971, a decrease of 263 tons, or 5 per cent., in quantity, and an increase of $13,629, or 6 per cent., in value, compared with 1926. The decrease in production was in the amorphous variety, the crystalline variety increasing both in quantity and value. The sales of amorphous and crystalline graphite were nearly equally divided, 2,595 tons of the former and 2,612 tons of the latter being sold or consumed by the producer. This was a decrease of 380 tons, or 13 per cent., in the former, and an increase of 235,200 pounds (117 short tons) or 5 per cent., in the latter. The value of the amorphous variety decreased $4,650, or 11 per cent., and the crystalline variety increased in value $18,279, or 10 per cent., compared with 1926. The quantity and value of crystalline graphite in 1927 were the largest since 1920. The manufacture of artificial graphite in New York decreased considerably, from 21,163,986 pounds in 1926 to 12,257,239 in 1927, or 42 per cent. The imports of graphite in 1927 amounted to 17,452 short tons, valued at $723,923, compared with 16,166 short tons, valued at $921,233 in 1926, an increase of 8 per cent. in quantity, but a decrease of 21 per cent. in value.

An Annual Market Review

Prospects of Future Development

THE Barter Trading Corporation, London, in their comprehensive annual market report, give a representative list of industrial chemicals and raw materials, with their current prices for January, 1928, and the variations between highest and lowest during 1927. In reviewing the year's developments the report states :—

1927 was a brighter year for British industries generally. Fortunately, it was comparatively unaffected by industrial strife, and substantial progress and real development were achieved. Continued depression, however, affects the coal, iron and steel industries, and little progress or expansion occurred during 1927, but even the more conservative minds are now inclined to see the silver lining in the clouds, although heavy tonnages of foreign iron and steel are still being imported and the works of our competitors are well filled with orders for heavy castings and forgings. Lancashire is still suffering from reduced demand and low prices, and those sections of the industry which have not manufactured the newer textiles are feeling the strain of running at much below their capacity. Agriculture is far from satisfactory, and many earnest minds are cogitating on schemes for assisting the farmer, and financial experts are considering arrangements for extended or increased credits.

Vitality of New Industries

While our basic industries are so afflicted, it is refreshing to recall the vitality and expansion of our newest industries, almost all of which make increasing demands for industrial chemicals. Artificial silk, artificial leathers, films, lacquers, solvents, synthetic fertilisers, etc., are industries which continue to expand and provide increasing employment. Low-temperature carbonisation of coal is the subject of intensive research and experiment, and results obtained so far suggest that the near future will see the dawn of a new era which should contribute materially to the return of the full measure of prosperity predicted for Britain's industries.

Mass production and controlled distribution by amalgamation or co-operation among kindred or interdependent industries are assuming a brighter and fuller interpretation. Centralised direction, a wise disposition of production, the utilisation of factory units for the most appropriate products, and the pooling and application of the results of the most recent researches are combining to effect economies and lower costs which—reflected in the selling prices—are enticing extending demands and opening up new markets. The benefit accruing is two-fold—greater aggregate revenue, providing a healthy reserve of financial resources, and higher real wages, with perhaps the most important factor in relationship to labour, security and continuity of employment.

Empire Opportunities

Propaganda through Empire trade conferences and Empire marketing development are raising anew in the minds of Britishers the potential demand and the vast opportunities within the Empire, and stimulating the will to foster and increase Empire trade.

It is unfortunate that in those industries which have been hardest hit it has been necessary to curtail wages or increase the working hours, but these palliatives would only be of a temporary duration if, with a reviving trade, industries generally could be relieved from the crippling handicaps of heavy State taxation, local taxation and high rates of transport. The return to the gold standard by this country in 1925, although accomplished in the face of a measure of doubt and criticism from responsible quarters, has established stable financial mediums of exchange which permit and encourage international trade upon a commercial basis without the deterring risks of wider fluctuating exchanges. The American dollar has moved strongly in our favour, and sterling has reached an appreciable premium in the United States, while European exchanges are becoming more and more stabilised.

These steadying influences should enable Britain to extend her export trade, fill her factories, and reduce unemployment. On the other hand, the keenest competition for overseas trade must be expected from those countries with improved financial position and lower wages rates.

America continues to prosper, and there is no indication yet, with her extraordinary resources and vast accumulation of wealth, that she has reached even a temporary saturation point. Crops of cotton and grain during the last season have been abundant, although the cotton crop was lower and only 12,900,000 bales. Canada has harvested a huge crop, and is forging ahead in industries and accumulating wealth rapidly. She will become a great trading Dominion, and Britain should energetically cater for her custom. The South American states are prospering, and every endeavour should be made to regain the position we once held of being one of the largest suppliers to these markets. France has stabilised the franc and is expanding in many directions, and not least in the chemical industry. Italy, under the present regime, is being organised, her industries fostered, encouraged and protected. Germany is forging ahead and is competing very keenly every day for export markets. In newer methods of chemical production she still holds an enviable position, and we cannot relax our efforts in research and production if we hope to compete with her. India is still subject to political influences, but this vast territory is developing and we ought to have the lion's share of its increasing trade. China, owing to its internal troubles, has been a most disturbed market, but signs are not wanting that here also peaceful development is in sight, and we may look forward with confidence to maintaining our position in her markets and gaining the benefit of the increased trade.

Good Prospects

The prospects for 1928 are good and, if the genuine attempt on both sides to unite the forces of capital and labour in this country for mutual and national benefit is blessed with success, the industrial record for the year will be one for congratulation.

Industrial Chemicals and Raw Materials.—The New Year opened with improving demand for home and export, and new industries such as artificial silk, lacquers, etc., are proving important and increasing sources of consumption on a large scale. The Continent still continues to compete for business, but the margin of difference in prices between home and foreign is less attractive to buyers.

Coal Tar Products and Intermediates.—Lower prices of co a have increased production. The introduction of sound and economic systems of low-temperature carbonisation is now only a matter of short duration. During the year 1928 a number of plants will be in operation, and the results are likely to be revolutionary in character. The problem has been definitely solved.

Fertilisers.—Continued development has taken place in the production of synthetic fertilisers, but with the increase and lower prices the demand seems to keep pace.

Wood Distillation Products and Solvents.—The production of synthetic methyl alcohol and acetic acid have further expanded, as also have butyl alcohol and acetone ; and with the exception of acetone, for which there has been an increasing demand, the others have all experienced lower prices.

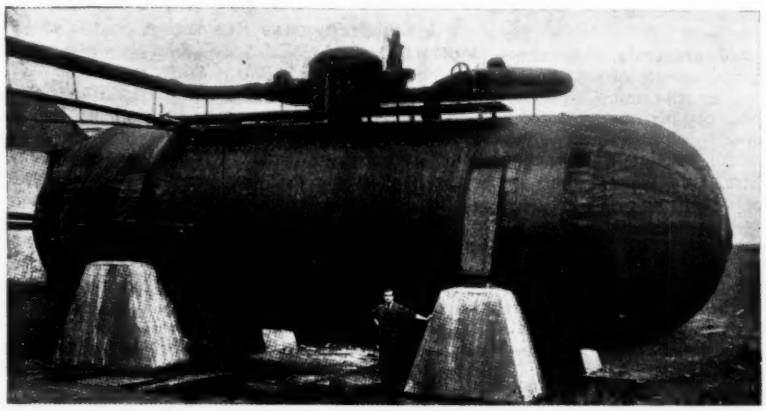
Chemicals in Canada in 1926

THE Dominion Bureau of Statistics has just issued its final report on the manufactures of chemical and allied products in Canada during the calendar year 1926. Several new features have been added to the report, including summary statistics for the ten-year period in order to indicate progress made along chemical lines during the past decade. Alphabetical lists of materials used and products made in the group as a whole, provide a convenient and comprehensive consolidation of data from the individual industries ; and more detailed information on imports and exports has been included in the various chapters throughout the report. A directory showing the names, addresses and plant locations of the firms reporting to the Bureau in this industry has been included ; this shows the scope of the report. Another feature of the report is the inclusion of summary statistics relating to those industries which use chemical processes in the manufacture of products not usually described as chemicals. If the larger definition of the chemical industry be taken as including all industries using chemical processes, the field covered represents not less than one-fifth of the aggregate of Canadian manufactures. The total value of the products of Canada's 556 chemical manufacturing plants in 1926, was $122,589,526, the capitalisation of the industry being $133,407,891, and the number of employees 14,345.

The Storage of Steam

Use of the Accumulator

In an industrial plant, shortage of steam in any one department restricts the output of the factory as a whole. Unfortunately, the steam consumption of the different departments fluctuates widely, while the various demands do not usually occur with any regularity in relation to each other. The steam boiler is not adapted to meet the wide fluctuations in load usually encountered in the manufacturing industries, partly on account of its limited thermal storage capacity and partly due to time lag in the adjustment of the firing equipment. To meet these conditions some other means must be adopted to take care of the variations in steam demand and for building up a reserve of thermal energy, instantaneously available for the service of the manufacturing plant. This is the function of the Ruths Steam Accumulator.



An Installation in a British Textile Mill.

By storing the surplus steam generated during periods of low load and giving this out during periods of peak load, the accumulator enables the steam-raising equipment to operate at a continuous rating corresponding to the average demand of the manufacturing plant. Apart from this, it maintains a constant pressure both on the high-pressure and low-pressure steam mains between which it is connected, thus ensuring a supply of steam to the manufacturing plant at an absolutely constant pressure and temperature—an extremely useful function in all industrial operations, particularly those employing delicate chemical and physical processes. The Ruths accumulator is based on the principle of storing the heat energy of steam in a large quantity of water under pressure and at saturation temperature, and releasing this energy in the form of steam produced by ebullition under a reduction in pressure. The accumulator is built in the form of a cylindrical shell with hemispherical ends. The plant consists of two parts: the accumulator proper, and the automatic valves which ensure the co-operation of the boilers and the accumulator, and govern the steam distribution throughout the works.

In the development of the Ruths accumulator system great attention has been paid to the design of the automatic regulator, as the whole success of the system depends upon accurate and sensitive control. The valve itself is of the double disc type operated by oil pressure acting on a servo-motor piston, the oil pressure being controlled by a pilot valve under the action of a relay.

In one case at a textile mill, before the installation of an accumulator, the plant suffered from a shortage of steam, and an expansion of the boiler house was considered. During the morning hours the heating up of dye kettles was considerably delayed, in spite of the fact that the kettles were pre-heated for an hour and a half before the beginning of the working day. In this way much time was lost, and operators were kept waiting. After investigation, it was decided to instal an accumulator, and the management stated that the resultant shortening of the period required for heating up the dye kettles gave rise to an increased output of finished material exceeding 10 per cent. Among factories in this country using the Ruths steam accumulator are those of Scottish Dyes, Ltd., Glasgow Corporation Gas Department (Provan Chemical Works), the Anglo-Scottish Beet Sugar Corporation, Ltd. and the Gas Light and Coke Co., Ltd. Many chemical works on the Continent are also using these accumulators.

Details of the Company

In accordance with Stock Exchange regulations, particulars have been advertised, for information only and not as an invitation to subscribe for shares, of Ruths Steam Storage, Ltd. The company has been formed to acquire exclusive manufacturing and sales licences for Great Britain and the whole of the British Empire, except Canada and Newfoundland, for all Dr. Ruths inventions covering his accumulator system, also his inventions relating to high pressure accumulators and high pressure boilers. The accumulators will be assembled and not manufactured by the company, with the consequent saving of a heavy outlay for a factory with attendant charges. The capital of the company is £300,000, divided into 275,000 "A" ordinary shares of £1 each and 25,000 "B" ordinary shares of £1 each, all of which have been or are to be issued. The whole of the 25,000 "B" ordinary shares and 50,000 "A" ordinary shares have been subscribed in cash by, and will be allotted to, the vendors or their nominees. In addition, the directors and their friends have applied for and will be allotted 70,000 "A" ordinary shares. The British Shareholders Trust, Ltd., of 3, Lombard Street, London, E.C., have undertaken to subscribe or to procure subscribers for the balance of the issue of 225,000 "A" ordinary shares. The cash working capital of £100,000 will enable the company, if necessary, to finance sales on the instalment plan.

Oil and Colour Chemists' Annual Meeting

The annual general meeting of the Oil and Colour Chemists' Association was held at the Institute of Chemistry on Thursday, May 10, Mr. C. A. Klein (president) in the chair. The report showed an increase in the ordinary members of five, bringing the total on May 1, 1928, to 374, after 16 names had been removed from the membership list. The scheme which had been developed for the formation of a class of junior members had made no headway, and the Council invited suggestions from the members in this connection. There was an excess of income over expenditure during the past year of £71. The report of the Manchester Section Committee for the year showed a satisfactory state of affairs. Referring to the specifications and standard tests, it was stated that the sub-committee and panels of the British Engineering Standards Association engaged in the drawing up of British standard specifications for pigments and varnishes had continued their operations during the past year. A summary of the position was given, from which it was seen that in addition to the specifications for pigment pastes, oils, thinners, varnishes, and ready mixed (linseed oil) paints already issued, the following specifications were in hand: ochre, zinc chrome, antimony oxide, titanium oxide, purple oxide of iron, aluminium powder, coloured oil pastes, tinted oil pastes, liquid driers, paste driers, turpentine, type II, and tung oil.

Commenting on the report, the President said that the sales of the Association Journal in America were quite considerable. The report and accounts were put to the meeting and adopted without discussion.

Dr. J. J. Fox was elected President, with Messrs. H. D. Bradford, Noel Heaton, C. A. Klein, and J. Russell Thornbery as vice-presidents. Messrs. J. B. Shaw and W. Geary were elected country ordinary members of Council. Mr. G. H. Grimshaw was elected country associate member, and Mr. R. P. L. Britton was elected town member of Council. On the motion of Dr. J. J. Fox, seconded by Dr. J. N. Goldsmith, a hearty vote of thanks was accorded to Mr. C. A. Klein for his work as President during the past two years.

Overseas Markets for Fertilisers

Netherlands East Indies, Cuba and Mexico

THE Netherlands East Indies provide an exceptionally good market for fertilisers, and owing to the steady expansion of rubber, tobacco, tea and coffee plantations in these islands the demand is increasing. Detailed particulars regarding the total importation of fertilisers into this market are not available, but imports into the East Coast Province of Sumatra alone amounted during 1926 to roughly 18,400,000 kilos compared with 17,500,000 kilos in 1925 and, 15,800,000 kilos in 1924. Generally speaking, the share of the trade enjoyed by Great Britain is small, and there undoubtedly exists ample scope for United Kingdom manufacturers to increase their sales. If this object is to be achieved, however, a closer study of the market's requirements must be undertaken, and the keenest possible prices must be quoted.

The principal fertilisers used are sulphate of ammonia, phosphates and super phosphates, liquid ammonia, nitrate of soda, potash fertilisers, chili saltpetre and basic slag, the first named being easily the most important. For tobacco plantations, the main fertiliser employed is a mixture of sulphate of ammonia, superphosphate and sulphate of potash, although all these ingredients are used and purchased separately. Basic slag is also used to a considerable extent in the tobacco fields. For rubber, sulphate of ammonia is the chief fertiliser required, although nitrate of soda is also largely used, whilst for the cultivation of tea, composite manures are mainly employed.

Sulphate of ammonia is principally supplied by the U.S.A., who enjoys approximately one-third of the trade, the remainder being in the hands of Germany, Great Britain, Holland and Belgium. The success achieved by American and German suppliers is solely due to their low prices, and efforts should be made by British firms to reduce their quotations whenever possible. Super phosphates and phosphates are principally obtained from Holland, Belgium and Germany, supplies from Great Britain being negligible. Holland and Belgium also control most of the trade in other fertilisers.

In addition to fertilisers, the Netherlands East Indies requires considerable quantities of insecticides, the chief among which are lead arsenate and paris green. This latter preparation, which is used for treating tobacco leaves, and for the prevention of insect pests, must contain 56 to 58 per cent. arsenous trioxide of which not more than 0.40 per cent. should be water soluble. It should be packed in tins of 5 kgs., 20 tins to a case. The cases should be of strong construction and heavily strapped with iron.

Orders for fertilisers are usually placed by importers and the larger estate agents in the Spring for shipment at the end of the year.

Cuba and Mexico

Cuba is another important market for the sale of fertilisers, although Great Britain has not succeeded in securing any appreciable share of the trade. The sugar and tobacco plantations are naturally the chief users of artificial manures, but the cultivation of fruit and vegetables is also carried on to a very large extent, and considerable quantities of fertilisers are required for this purpose.

It is estimated that the annual sales of fertilisers in Cuba amount to about 110,000 tons, of which American manufacturers supply 80,000 tons, local concerns 20,000 tons, and German firms the bulk of the remainder. The most usual fertiliser for sugar cane growing which is applied during February, March and April, is 10, 10, 3 phosphate, nitrate and potassium. Fair quantities of sulphate of potash, sulphate of ammonia and basic slag are also required.

In spite of the 20 per cent. tariff preference accorded to American manufacturers, United Kingdom firms should not find it very difficult to obtain a certain share of the Cuban demand for fertilisers, as in many cases American preparations are more expensive than other makes. The tariff payable on artificial fertilisers is $0·05 per 100 kilos, and it should be noted that only those having definite formulæ printed on the container are accepted. Natural fertilisers are admitted free.

The Cuban market requires careful cultivation, and business can only be secured through the services of a competent agent.

The importation of chemical fertilisers into Mexico is also of sufficient importance to warrant the close attention of British firms. Sugar, cotton, rubber, maize, coffee, rice, vegetables and fruit, etc., are all cultivated on an important scale, and as all these industries require large quantities of artificial manures annually, the market offers excellent opportunities for enterprising United Kingdom firms to increase their trade. Sulphate and liquid ammonia, nitrate of soda, potash fertilisers and basic slag are the principal fertilisers required, and these are mainly obtained from the U.S.A. and, to a less extent, from Germany. Imports of chemicals generally to this market during 1926 show a considerable increase over the total for the previous year, and future prospects are therefore promising. The appointment of a local agent who would be in a position directly to approach farmers and growers would provide the most effective means of securing business.

International Nitrogen Conference

A Comprehensive Resolution

AT the end of the International Nitrogen Conference, held May 1–8, the following resolution was passed :—

"The participants in the Second International Nitrogen Conference, held in the Adriatic on board the steamer *Lützow*, are unanimous that food and clothing for the growing population in sufficient quantity, and without increase of price, can only be supplied by means of an ever-increasing application of artificial fertilisers. An increasing use of artificial fertilisers is therefore an important means of promoting the welfare of mankind. For the realisation of this aim, the participants consider it of importance :

"(a) *On the part of industry :* (1) In the erection of new synthetic fertiliser factories, to choose sites permitting of production at the lowest possible cost ; (2) That all scientific and technical advances be applied to the cheapening and improvement of production ; (3) That forms of fertiliser be discovered and produced which offer the possibility of satisfying the varying demands of different plants and the varying conditions of soil and climate, no fertiliser hitherto known being suitable under all conditions ; (4) That artificial fertiliser be transported to the user by the shortest route and at the lowest cost ; (5) That fertilisers be supplied to the user at the lowest price compatible with the health of the industry and the further improvement of its processes.

"(b) *On the part of agriculture:* (1) That the use of artificial fertilisers be increased until the user obtains the limit of return ; (2) That the efficiency of fertilisers be improved through comprehensive research of the laws governing the life and growth of plants ; (3) That the known results of research be extended by further investigation.

"(c) *On the part of Governments :* That organisations be promoted to provide cheap and sufficient credits for the purchase of synthetic fertilisers by the user ; (2) That all Governments should give special consideration to the financial position of agriculture."

Institute of Chemistry Pass List

THE pass list for the April-May examinations of the Institute of Chemistry is as follows :—*Examination in General Chemistry for the Associateship.*—Bessey, G. E. (Central Technical College, Birmingham ; and Birkbeck College, London) ; Cox, E. E. (Central Technical College, Birmingham) ; Davies, E. C. (Central Technical School, Liverpool) ; Elson, L. A., B.Sc. (Technical College, Loughborough) ; Foster, F., B.Sc. (The University, Leeds) ; Hopkinson, G., A.M.C.T. (Wigan and District Mining and Tech. College ; and College of Technology, Manchester) ; McIntyre, J. (Royal Technical College, Glasgow) ; Rogans, E. S. F. (Central Technical School, Liverpool) ; Ward, R. (Central Technical School, Liverpool) ; Wilson, T. N. G. (Royal Technical College, Glasgow). *Examination in General Chemistry for the Associateship held in Johannesburg in February*, 1928.—Ochse, O. L., B.Sc. (University College, Johannesburg). *Examination for the Fellowship in Branch E, The Chemistry, including Microscopy of Food and Drugs, and of Water.*—Back, S., B.Sc. ; Barraclough, A., B.Sc. ; Buist, W. F., B.Sc. ; Bullock, F. C., B.Sc. ; Chignell, G., B.Sc. ; Jones, D. E., M.Sc. ; Leather, A. N., B.Sc. ; Voelcker, E., A.R.C.S. ; Walker, G. H., Ph.D. *Examination for the Fellowship in Branch F, Agricultural Chemistry.*—Knowles, F. *Examination for the Fellowship in Branch G, Industrial Chemistry, with special reference to the chemistry and bacteriology of water supply.*—Burtt, A. W., M.Sc.

Calcium Biphosphate Inquiry

Definition of a Fine Chemical

AFTER an adjournment lasting for some time, owing to the illness of the chairman (Mr. A. A. Hudson, K.C.), the Committee which is considering the application of manufacturers that calcium biphosphate of baking powder quality should be included in the Board of Trade list of articles chargeable with duty under Part I of the Safeguarding of Industries Act resumed its inquiry, at the offices of the Board of Trade, at Westminster, on Wednesday.

The evidence for the applicants having been completed, the Hon. Stafford Cripps, K.C. (for the applicants), addressed the Committee with regard to a previous suggestion that the amount of calcium sulphate which might be contained in the calcium biphosphate of baking powder quality should be defined. The decision to define the calcium biphosphate as "of baking powder quality" was arrived at after careful thought. If the definition "of baking powder quality" were adopted, it would ensure that anything which the Ministry of Health from time to time permitted to be used for baking powder would be taxed.

Mr. JAMES WHITEHEAD, K.C. (addressing the Committee on behalf of the opponents) submitted that the definition of the substance as "of baking powder quality" defined nothing. It was obvious, from the way in which Mr. Cripps himself had put it, that it was a definition which was to have a shifting effect; it would depend upon steps taken hereafter by the Ministry of Health. He was desirous that the phrase "of baking powder quality" should be deemed by the Customs officers to have been satisfied if the material imported into this country contained calcium sulphate to the extent of not more than 10 per cent. Even if the quantity of calcium sulphate in the biphosphate was strictly limited to 10 per cent., it meant that this tribunal was asked to decide that calcium biphosphate was a fine chemical, notwithstanding that it might contain as much as 10 per cent. of calcium sulphate.

Tests for Fine Chemicals

The first question for the tribunal to consider was upon whom the onus lay of proving that calcium biphosphate of baking powder quality should be included in the list of dutiable articles, and undoubtedly the onus was upon the applicants. They sought its inclusion simply on the ground that it was a fine chemical. In the absence of a clearly defined trade usage, the tribunal could resort to other tests in trying to resolve the riddle. One such test was that of purity. Was he not right in suggesting that, broadly speaking, the fine chemicals sold in this country and abroad were the pure chemicals, and that the heavy chemicals were not so pure?

Other tests suggested by Mr. Whitehead were homogeneity of constitution, method of manufacture, type of vessel used in manufacture, and nature of labour employed (skilled or unskilled).

Mr. E. J. PARRY, B.Sc., F.I.C. (consulting chemist), gave evidence in opposition to the application, and said that prior to the holding of this inquiry he had never heard the expression "calcium biphosphate of baking powder quality," although he had made an extensive search of trade literature with a view to discovering how it was classified. He produced a number of catalogues and advertisements in support of his statement.

In reply to the chairman, he said that a fine chemical should be an individual body of as high a degree of purity as could be made. The vast majority of the fine chemicals in the Board of Trade list of dutiable articles were approximately 100 per cent. pure. There were various criteria in deciding whether or not a chemical was a fine chemical, but not one of them was a conclusive criterion, and there were exceptions to every criterion that could be suggested. The large majority of fine chemicals were used in medicine, pharmacy, perfumery, photography, and generally in the smaller and more luxurious arts or industries, and for scientific purposes. He could find no category of fine chemicals into which acid calcium phosphate of baking powder quality fitted.

The inquiry was adjourned till Thursday.

I.C.I. Report

Gross Earnings of £4,567,225

THE first report of Imperial Chemical Industries, Ltd., showing accounts made up to December 31, 1927, has just been issued. Towards the end of 1925, proposals were made for the fusion of interests, on share exchange terms, of Brunner, Mond and Co., Nobel Industries, the United Alkali Co., and the British Dyestuffs Corporation. With 100 per cent. acceptance on the part of the respective shareholders, the company has developed on lines which the directors, in their report, record as a period of convalescence and recovery from the ills of 1926. The directors say that the trade of many of the company's subsidiary companies has reflected this condition. In view of this fact, which has naturally affected the aggregate profit of the company, the directors regard the result of the year as very satisfactory.

The receipts brought to account in respect of the company's operations, comprise the dividends received from the four participating companies which constituted the merger, and from certain other companies acquired during 1927. The profit for the year as shown by the balance sheet, before providing for income tax, amounts to £4,567,224 15s. 6d. As is shown in the accounts, taxation provision amounts to £125,330.

New Capital Works

It is explained that large expenditure has taken place on new capital works, which has been entirely financed out of the resources of the subsidiary companies. For this purpose investments have been realised, resulting in a capital profit arising to the selling companies which exceeds £1,000,000. This profit has been carried to reserve in the books of those companies, and, not having been brought into the accounts of Imperial Chemical Industries, Ltd., forms no part of the profit of £4,567,224 15s. 6d. stated.

The dividend recommendations were made known a few weeks back, and interest now centres in the allocations of the gross profit. There is to be appropriated to general reserve the sum of £408,976, which, with £291,024 transferred from share premium account, creates a general reserve of £700,000. Provision for taxation is £125,330, and the undivided surplus of £82,680 is carried forward. The preference service requires £1,145,500, while the fixed 7 per cent. upon the ordinary capital calls for £2,302,116; together, these make £3,447,620. There remains £502,620, and under the terms of distribution between ordinary and deferred capital, this amount is divided in such manner as to afford an extra 1 per cent. to the ordinaries (making 8 per cent in all) and 1¾ per cent. to the deferred, the respective distributions aggregating £333,486 and £169,133, *i.e.*, two-thirds basis to the first named.

The report adds that during the year, considerable progress has been made with the consolidation of all the interests brought together by the formation of the company. Steps have also been taken to acquire, by exchange of shares or otherwise, the business of the Cassell Cyanide Co., Ltd., Casebourne and Co. (1926), Elliott's Metal Co., Ltd., the British Copper Manufacturers, Ltd., and certain other smaller companies.

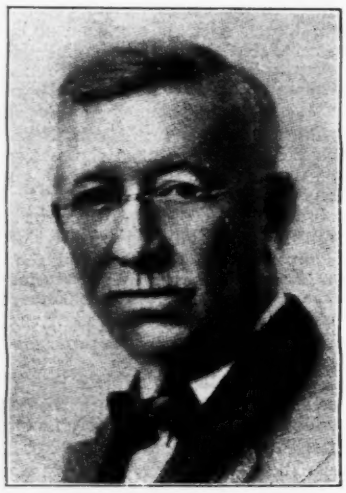
The Balance Sheet

Of an authorised capital of £65,000,000 the company's balance sheet as at December 31 last shows £57,798,135 as actually issued and £371,714 as contracted to be issued for investments acquired, making a total of £58,169,849. As explained above, the reserve is made up to £700,000. Deposits and current accounts with subsidiaries amount to £7,651,382, and sundry creditors to £846,480. On the other side there are investments at cost, being mainly shares in subsidiary and associated companies, to the total of £58,800,700. There appears £1,260,950 for preliminary expenses, which approximates the estimate, but which, it must be noted, is not reduced by special application from profits. Loans and current accounts of subsidiaries and associates amount to £8,345,230; sundry debtors include income tax recoverable from final dividends, and are given at £754,183. The cash balances in hand and at bank are £661,915, while contingencies to an unnamed amount are existent in connection with open offers.

The balance sheet total is £69,871,792. The ordinary general meeting of the company is convened for Thursday, May 31, at 12.30 p.m., at the Hotel Cecil, Strand, London, W.C.2.

Death of Professor E. F. Smith

THE American journal *Science* announces the death, on May 3, at the age of 73, of Dr. Edgar F. Smith, emeritus professor of chemistry in the University of Pennsylvania, and president of the American Chemical Society in 1895.



1921 and 1922. He published a large amount of original research work on analytical and inorganic chemistry, while of late years he had devoted himself to the study of the history of chemistry, especially early American chemistry.

British Beet Sugar Industry

Report of Ministry of Agriculture

THE beet sugar industry in this country is reviewed in a report on acreage and production of crops, etc., for 1927, just issued by the Ministry of Agriculture. The total acreage under sugar beet was 222,566 acres, as compared with 125,814 in 1926, an increase of 96,752 acres. The largest area was in East Anglia and the East Midlands, where eleven factories were operating, including two new factories built in 1927. The county with the heaviest acreage was Norfolk, where 51,444 acres, or 23 per cent. of the total acreage for the whole country were grown last year. Suffolk came next with 35,862 acres, whilst Lincolnshire had nearly doubled its acreage with an increase from 16,320 acres in 1926 to 31,932 acres in 1927. The large increase in Yorkshire from 5,088 acres in 1926 to 17,090 acres in 1927 was mainly due to the erection of the new Selby factory, whilst in Shropshire, where a new factory was built at Allscott, the increase was from 2,289 acres in 1926 to 10,007 acres in 1927.

The number of factories in England ad Wales increased to seventeen by the addition of four new factories, namely, at Allscott (Salop), Bardney (Lincs), King's Lynn (Norfolk), and Selby (Yorks), while the small desiccation-process factory at Eynsham also commenced operations on a commercial scale in 1927. In addition, the beet slicing capacity of three factories—Felstead (Essex), Kidderminster, and Spalding—was doubled, and the plant and machinery of several others were augmented. The following are results in the past four years:

	Acres.	No. of Factories in England and Wales.	Production of Sugar.	Production of White Sugar per acre beet under cultivation.
			cwt.	lb.
1924–5 ..	22,441	3	478,308	2,387
1925–6 ..	54,750	8	1,032,759	2,113
1926–7 ..	125,814	12	3,003,933	2,674
1927–8 ..	222,566	17	3,700,000*	1,862*

* Estimated.

Owing chiefly to unfavourable weather, the season 1927–28 has been, however, the worst on record.

Cotton and Wool Dyers' Meeting

Improved Position of Dyestuff Industry

THE twenty-ninth ordinary general meeting of the British Cotton and Wool Dyers' Association, Ltd., was held at Manchester on Thursday, May 17. Mr. Adolph Hoegger, the chairman, in moving the adoption of the report, referred to conditions in the dyestuffs industry. In his address last year he had alluded to the fact that the dyestuffs industry in this country was in a better position than it had been at any other period, and since then the situation had still further improved. During 1927 some twenty dyestuffs not hitherto made in Great Britain had been produced and put on the market. In addition, several actual new dyestuffs had been made by British firms.

A year ago negotiations were said to be in progress regarding a combination between Imperial Chemical Industries, Ltd., and the Farbenindustrie A.G., but as far as was known nothing appeared to have materialised on those lines. Prices of dyestuffs were gradually being reduced, though in many cases they were still considerably higher than those of corresponding colours made on the Continent. On September 1 last the factor used in determining application for import licences on price grounds was reduced from two and a half to twice pre-war prices. This was not greatly in excess of the Board of Trade wholesale price index figure. According to the President of the Board of Trade, the imports into the United Kingdom of synthetic dyestuffs amounted to 40,000,000 lb. in 1913 and to 4,750,000 lb. in 1927. Production in the United Kingdom amounted to 9,000,000 lb. in 1913 and to 35,500,000 lb. in 1927.

With regard to the Fastness Committee of the Society of Dyers and Colourists, although several sub-committees were in operation, it would be some time, he said, before a report was available. There was an ever increasing demand by manufacturers for colours with a greater degree of fastness. The Association welcomed this, and encouraged it at every opportunity. Referring to their interests in the Nuera Art Silk Co., Ltd., Mr. Hoegger stated they were now handling silk manufactured by this company, and had found it satisfactory in dyeing and other processes. Exhaustive experiments were being made in connection with the manufacture of a new silk which surpassed other artificial silks in tensile strength, both in the wet and the dry state.

The report was adopted unanimously.

In seconding a resolution that 5,000 guineas be paid to the general board of directors, Mr. D. G. Henriques said that the return to prosperity in the face of the most difficult year through which they had just passed was a matter for congratulation to the board.

Annual Meeting of W. J. Bush and Co.

Merging of Solvent and Plasticiser Interests

THE thirty-first annual general meeting of the shareholders of W. J. Bush and Co., Ltd., was held on Friday, May 18, in London. Mr. J. M. Bush (chairman and managing director) presided. In the course of his remarks regarding the report and statement of accounts for 1927, Mr. J. M. Bush said that trade continued dull during the period covered by the accounts, and their turnover and net profit were approximately the same as in the previous year. Competition had been keen, especially in fine chemicals, and the benefits derived from increased efficiency in manufacture and from rigid economy had been passed on to the buyers of their products. It was probable that they might have to regard present conditions as normal, and therefore must look to the manufacture of additional products for the maintenance of their prosperity. In the middle of the year they merged their interests in the manufacture of solvents and plasticisers, used in the cellulose lacquer industry, with those of the Methylating Co. The latter company was in close alliance with the Distillers Co., which, they were informed, would shortly be in a position to manufacture in this country certain of the basic raw materials used in the manufacture of these solvents. When that took place, it would make this country self-supporting and independent in respect of supplies of these indispensable products, and should do much to stabilise and promote the prosperity of the cellulose lacquer industry.

Chemical Matters in Parliament

Extraction of Oil from Coal

Mr. Hardie (House of Commons, May 14) asked the Secretary for Mines the cost of treating one cwt. or one ton of coal by the Bergius system of extracting oil from coal. Commodore Douglas King, in reply, stated that the Bergius process was still in the experimental stage, and no plant of a commercial size was in existence in this country, so that it was impossible to give even a rough estimate of the cost of the process.

Bergius Process of Oil Extraction

In answer to Mr. Whiteley (House of Commons, May 17), Commodore Douglas King stated that experiments on a laboratory scale were carried out at the Fuel Research Station, from 1923 to 1926, and since that year on a small technical scale. The cost to date was approximately £10,000. Special experiments were carried out for the Department of Scientific and Industrial Research by Dr. Bergius in Germany from February, 1926, to April, 1927. The cost of these experiments was £15,533 Experiments on a small scale had also been carried out at Birmingham University, and he understood that the subject was being studied exhaustively by at least one commercial undertaking.

Low Temperature Carbonisation Systems

In reply to Mr. Oliver (House of Commons, May 17), Commodore King stated that there were at least 11 different systems of low temperature carbonisation represented in this country, either in existence or stated to be in course of erection, with a capacity of from 10 to 250 tons a day. No definite figures were available, but the total working capacity of such plants was probably 1,000 tons a day.

Working Conditions in Artificial Silk Industry

Replying to questions by Mr. Kelly (House of Commons, May 17) relative to injuries to hands and eyes of artificial silk workers, Sir W. Joynson-Hicks stated that there did not appear to be sufficient grounds for scheduling conjunctivitis of the eyes under the Workmen's Compensation Act. He was informed that even the severer cases did not disable workmen for more than one or two days, and where, in exceptional cases, it caused more prolonged disablement it had been due to actual splashes of acid into the eye, which would constitute an accident within the meaning of the Act. Sores on the hand which were sometimes caused by acid appeared to be covered by the diseases already scheduled under the Act, as dermatitis or ulceration of the skin produced by dust or liquids.

Beet Sugar Effluents

In reply to Mr. W. M. Adamson (House of Commons, May 19) Mr. Guinness said that during the 1927–28 beet sugar manufacturing campaign, the Department of Scientific and Industrial Research carried out working scale experiments on the biological treatment of effluent from one of the largest beet sugar factories in the kingdom. Fundamental research work was being carried out at the Rothamsted Experimental Station. The results were promising but could not be considered conclusive.

The Dead Sea Concession

In reply to Col. Howard-Bury (House of Commons, May 21), Mr. Amery said that the results of the negotiations with Major Tulloch and Mr. Novomeysky were still under examination by the Palestine and Transjordan Governments. In reply to further questions by Col. Howard-Bury, Mr. Amery stated that at a time when the terms offered in one of the applications was thought to be the most favourable to the Palestine and Transjordan Governments of those which had then been submitted, the group which had made that appliction was asked by the Crown Agents to discuss the matter further with a view to clearing up certain doubtful points, including questions of finance, arising out of its application. The financial guarantees arranged by this group were subsequently withdrawn and its application was, in consequence, not accepted. He was not aware that the delay in terminating negotiations was playing into the hands of certain Central European interests. The tender of Major Tulloch and Mr. Novomeysky was accepted at the time that the tenders were issued. Therefore, if they could provide satisfactory guarantees in every respect as to the manner of working, they would naturally have a prior claim over anyone who did not tender at the time.

Lord Islington (House of Lords, May 23) asked what progress had been made towards the settlement of the Dead Sea concession; whether the Government was now prepared to give the names of the group backing Mr. Novomeysky and Major Tulloch, and to what extent that group was prepared to finance the undertaking; and further, what consideration the Government was giving to an application for developing the enterprise on the basis of a "merger" of interests under British control, made to the Government in February last by a powerful British group with the necessary capital and willing to accept conditions more favourable than any yet put forward. He moved for papers. The group to which he referred in the latter part of his question was prepared to start at once and carry out a complete "merger" of all the interests, British, Arab, or Jewish. This group was dealing in chemicals and fertilisers. It had a selling agency in this country with branches all over the world. There was no mystery about it, and he had full authority, if the House so desired, to give the names of those in the group.

The Earl of Birkenhead (Secretary for India) replied that he could undertake that the names of those forming the group supporting Messrs. Novomeysky and Tulloch would be laid before their Lordships before any binding agreement was signed, but he could not undertake that the terms of the agreement would be laid before the House before the agreement was signed. No delicate negotiations could be conducted if other interests could ask noble lords to press their competitive claims upon such an occasion.

Lord Lovat explained that it had been very clearly brought out in the suggested agreement that the company would be absolutely prohibited, without the consent of the Government, from going into any contract, arrangement, or understanding with any company or person for restriction of output or raising of prices.

Two Shift Systems in Artificial Silk Factories

Mr. Kelly (House of Commons, May 21) asked the Homel Secretary the reasons given by the British Enka Artificiar Silk Co., Ltd., Nuera Art Silk, Ltd., and Brysilka, Ltd., for the granting of the Order, under Section 2 of the 1920 Act, for the working of the two-shift system by children, young persons, and women; and how many workers were concerned?

Sir V. Henderson, in reply, stated that in all the three cases the object was to increase the output in certain processes in order to keep pace with the output in other processes.

Smoke Nuisance Summons Withdrawn

At North Police Court on Monday W. J. Bush and Co., Ltd., of Ash Grove, Hackney, were mentioned in connection with a summons under the Public Health Act for allowing dense volumes of smoke to be emitted from their factory chimney, after a notice to abate the nuisance had been served on March 24 last. Mr. Chalenor said he appeared for the Hackney Borough Council, and he understood that the facts were admitted. The Council had been informed that the company had undertaken many alterations and additions to their factory which would mean the expenditure of many thousands of pounds. While these works were in progress the company had given an undertaking that the nuisance would be abated. Messrs. Bush were one of the largest manufacturing firms in the borough. Having regard to all the circumstances he was instructed to withdraw the summons. Mr. Basil Watson (the magistrate) agreed, and the register was marked accordingly.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

100. (*Toilet Preparations*).—An Indian firm is anxious to obtain information on formulæ and processes for the preparation of vanishing creams and cosmetics.

101. ("*Glucoline*").—A subscriber desires to be put in touch with manufacturers of a gum known by the trade name of "Glucoline."

From Week to Week

INDIAN INDIGO EXPORTS for March, 1928, amounted to 118 cwt., a similar figure to that for 1927.

RECENT WILLS INCLUDE: Mr. William King Baker, a director of Baker Perkins, Ltd., £27,788 (net personalty £16,607).

EXTRAORDINARY RESOLUTIONS in connection with the reconstruction of British Glues and Chemicals, Ltd., were confirmed on Friday, May 18.

A SOAP FACTORY in full production, 20 miles from London, with modern plant, having a present output of over 35 tons per week, is advertised for sale on p. xli.

THE OUGREE STEEL TRADING CO., LTD., as from May 19, has changed its address to Stone House, Bishopsgate, London, E.C.2. Telephone number: Bishopsgate 5951–2–3–4–5.

THE CAPITAL of Continuous Coal Carbonisation, Ltd., has been increased to £105,000 by the creation of 200,000 "A" shares of 5s. each, ranking *pari passu* with the existing shares.

THERE IS ONLY ONE IMPORTANT producer of sulphur in Chile, the firm of Espada and Donoso, of Santiago, which operates in the vicinity of Tocora. It is estimated that the firm produces about 90 per cent. of the domestic output.

LORD HUNSDON and the Hon. Vicary Gibbs have resigned their seats on the board of the Alianza Nitrate Co. The Chilean agency has been transferred from Gibbs and Co. to Señor Santiago Sabioncello, who has joined the London board as chairman.

A NEW PLANT for making sulphuric acid from pyrites was opened on Thursday, May 17, at the Bradford Corporation Sewage Works at Esholt. The plant is capable of turning out 8,500 tons of acid a year, equal to two-thirds of the Corporation's needs.

MALCOLM OWEN, LTD., of 54, Newcomen Street, London, S.E.1, have obtained a license from Stafford O'Brien and Partners, in connection with a new process of plating on to aluminium surfaces. Aluminium, by this process, may be plated with nickel, copper, and chromium.

APPLICATIONS FOR GRANTS from the research fund of the Chemical Society must be received on or before Friday, June 1, on forms which can be obtained from the Assistant Secretary, Chemical Society, Burlington House, Piccadilly, London, W.1. Details are given in our advertisement columns, p. xli.

A NEW PROCESS of three-colour photography on films is stated to have been perfected by a group of scientific and business men, among whom are included Mr. H. O. Klein, Mr. T. Thorne Baker, Dr. L. C. Martin (of the Department of Optics, Imperial College), and Major Klein, colour adviser to the Calico Printers' Association.

THE PERCENTAGES OF WORKERS recorded as unemployed on April 23 in chemical manufacture in Great Britain and Northern Ireland was 5·9 per cent. (6·7 per cent. males, 3·4 per cent. females); in explosive manufacture, 5·5 per cent. (5·6 per cent. males, 5·4 per cent. females); in paint and varnish manufacture, 4·1 per cent. (4·5 per cent. males, 2·8 per cent. females).

NO SETTLEMENT was reached in the dyeing and allied trades on Tuesday, when representatives of employers and men met at Manchester, and the union decided to call out their men on June 16. The unions seek to establish collective piece work in all firms where, at present, that system does not operate, and ask that while negotiations on these lines are proceeding the wages of time workers shall be advanced by at least 25 per cent.

AN INVITATION to visit the United States in 1932 has been extended to the Institute of Metals by the American Institute of Mining and Metallurgical Engineers. At the recent annual meeting of the Institute of Metals, Dr. W. Rosenheim, the president, indicated that the invitation would be accepted. Further particulars may be obtained on application to Mr. G. Shaw Scott, Secretary, Institute of Metals, 36, Victoria Street, London, S.W.1.

A FORECAST OF THE NITROGEN PRODUCTION during 1928 was made by the Prussian Minister of Agriculture at a recent meeting of German fertiliser interests. He estimated that the world production during 1927 was 1,400,000 tons of nitrogen and forecast production for 1928 to be 1,679,000, an increase of approximately 20 per cent. He further estimated that 52 per cent. of the 1928 output would be ammonia nitrogen, 34 per cent. nitrate nitrogen and 14 per cent. calcium cyanamide.

THE ANNUAL REPORT of H.M. Inspector of Explosives, just published, states that in 1927 the total number of accidents during the year 1927 was 367, as a result of which 40 deaths occurred, while 365 people were injured. The increase over 1926 was due to the fact that the coal mines were closed during that year. The accidents in 1927 included 56, which occurred in the manufacture of explosives, resulting in the deaths of six persons and injuries to 14 others. In a science class some students were experimenting with gunpowder and were told to mix ; otassium chlorate, potassium nitrate, charcoal, and sulphur in a mortar, with the result that an explosion occurred and the boy mixing the ingredients was injured. "It would be well," it is added, "if authors of text books on chemistry would draw attention to the dangerous properties of these mixtures."

SIR EDWARD BROTHERTON on Saturday, May 19, opened the new club-house of the Yorkshire Aeroplane Club at Sherburn-in-Elmet.

AN EXTRA DIVIDEND of 3 dollars per share has been declared by the du Pont de Nemours Co., out of profits received from the company's holdings in the General Motors Corporation.

PROFESSOR F. G. DONNAN, F.R.S., will give one of the evening discourses at this year's meeting of the British Association in Glasgow. He will take as his subject "The Mystery of Life," the subject being considered from the physico-chemical standpoint.

INSURED UNEMPLOYED PERSONS in Great Britain and Northern Ireland at April 23 in chemicals manufacture were 5,474 (4,717 males, 757 females); in explosives manufacture 1,009 (686 males, 323 females); in paint and varnish manufacture 741 (622 males, 119 females).

THE REPORT of the sub-committee on the British Pharmacopœia of the Committee of Civil Research has just been issued. It is recommended, among other things, that a new body be formed, to be known as "The Pharmacopœia Commission," to prepare future editions of the "British Pharmacopœia," which should be issued at stated intervals of ten years, supplements being issued as required.

SIR ALFRED MOND, at the annual meeting of the Institution of Mining and Metallurgy at Burlington House, on Thursday, May 17, was presented with the gold medal of the Institution, the highest honour which it confers. The president (Mr. R. E. Palmer) said, in making the presentation, that it was in recognition of the services of Sir Alfred Mond in the development of the mineral resources and metallurgical industries of the Empire.

A FRENCH COMPANY was stated to be among the concerns submitting proposals to the Sao Paulo State Government for the establishment of a synthetic fertiliser industry in Brazil. The call for tenders made by the Government stipulated that only the proposals of those concerns able to manufacture a minimum of 70,000 tons a year of phosphates, and 60,000 tons of nitrogenous fertilisers, as well as by-products, would be taken into consideration.

AT THE ANNUAL MEETING of the Belfast and District Section of the Institute of Chemistry, on Friday, May 18, a suggestion was made that at the beginning of next session the section might hold an exhibition of chemical work carried out in Ulster. Dr. W. H. Gibson said that they could get into touch with manufacturers and ask them to send exhibits. The following officers and committee were elected: Chairman, Dr. W. H. Gibson; hon. treasurer, Dr. W. Honneyman; hon. secretary, Mr. J. C. A. Brierly; committee: Messrs. A. P. Hoskins, R. Blake, F. Dickinson, and J. W. E. Haller.

THE COMMITTEE OF AWARD for the Commonwealth Fund Fellowships have made the following appointments to Fellowships tenable by British graduates in American universities for two years beginning in September, 1928:—Mr. J. M. Robertson, of Glasgow University and the Royal Institution, London, to the University of Michigan, in Chemistry; Mr. R. Spence, Armstrong College, Durham University, to Princeton University, in Physical and Engineering Chemistry; Mr. M. P. Inglis, of Liverpool University, to the University of Illinois, in Metallurgical Engineering; Miss C. S. Steele, St. Andrews, to the University of Illinois, in Organic Chemistry.

ARTIFICIAL SILK NEWS.—J. Hetherington and Sons have booked an order from Kirklees, Ltd., for artificial silk machinery, amounting to over £100,000 in value.—Branstons Artificial Silk Co., Ltd., has issued its first report, in which it is stated that it would have been possible to enter production before the end of the financial year, but it was considered advisable to postpone the installation of parts of the plant in order to reap the benefit of recommendations made by Harbens, Ltd., as the result of recent investigations.—Jedburgh Town Council has granted an application by the North British Artificial Silk Co., Ltd., to erect a factory at Canongate Mills, Jedburgh.

Obituary

MR. HARRY ERNEST HARDING, chemical merchants' buyer, at 402, High Road, Leytonstone, aged 58, on May 9.

DR. EDGAR F. SMITH, emeritus professor of chemistry in the University of Pennsylvania. A portrait and notice appear on another page.

DR. ARTHUR JOHN WALKER, research chemist to Nitram, Ltd., at Maidenhead, on an unknown date, at Dolly Wagon Pike Gully, Helvellyn. He was engaged for some time on agricultural research at Harpenden, and afterwards went to Nitram, Ltd. He died through falling from a narrow foot-hold, while climbing in the Lake District.

MR. S. H. PEARCE, M.Inst.M.M., formerly president of the Chemical, Metallurgical, and Mining Society of South Africa, recently, in South Africa. After receiving his early training with Johnson and Sons, of Finsbury, he went out to South Africa in about 1890. At the time of his death he was in charge of the metallurgical work at the Crown Mines, where he had been since 1911.

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British

COAL, TAR, ETC.—Base exchange and the formation of coal. E. Mck. Taylor. *Nature*, May 19, pp. 789–790.

The effect of pre-oxidation on the primary distillation products of coal. II. The controlled preliminary oxidation of the coal. J. T. Donnelly, C. H. Foott, H. Nielsen, and J. Reilly. III. The effect of carbon dioxide, carbon monoxide, hydrogen, and nitrogen on coal at temperatures up to 200° C. W. J. Barrett, C. H. Foott, and J. Reilly. *J.S.C.I.*, May 18, pp. 139–142T, 142–143T.

A chemical study of low-temperature tar. G. T. Morgan. *J.S.C.I.*, May 18, pp. 131–133T.

DYEING, ETC.—A theory of leather dyeing. H. Salt. *J. Soc. Dyers and Colourists*, May, pp. 134–137.

The colouring of cold-cured rubber. W. E. Sanderson. *J. Soc. Dyers and Colourists*, May, pp. 137–142.

The fastness properties of wool dyestuffs. The phenomenon of isolation. J. S. Heuthwaite. *Canadian Colorist and Textile Processor*, May, pp. 154–156.

FOOD.—The chemistry of bread. D. W. Kent-Jones. *J.S.C.I.*, May 18, pp. 143–149T.

GENERAL.—The problem of the artificial production of diamonds. C. H. D. *Nature*, May 19, pp. 799–800.

Determination of the degumming power of soaps (boiling-off soaps). T. Tsunokae. *J. Soc. Dyers and Colourists*, May, pp. 131–133T.

The photo-oxidation of certain organic substances in the presence of fluorescent dyes. C. W. Carter. *Biochem. J.*, Vol. XXII, No. 2 (1928), pp. 575–582.

Electrolytic bleach liquor for artificial silk. W. Bennett. *Silk Journal*, May, pp. 60–61.

OILS.—The composition of the fatty acids of palm oil. A. Rayner and S. G. Campbell. *J.S.C.I.*, May 18, pp. 149–150T.

PLANT.—A rotating tube drying furnace. J. A. L. Ortlepp. *J. Chemical, Metallurgical, and Mining Society of South Africa*, March, pp. 210–213.

WATER.—Some characteristics of colliery surface and mine waters. N. Simpkin. *J.S.C.I.*, April 20, pp. 114–116 T.

United States

ANALYSIS.—Ceric sulphate as a volumetric oxidising agent. I. Preparation and standardisation of solutions. Determination of calcium. II. Determination of iron. III. The titration of iodide. IV. The determination of arsenic. V. The determination of antimony. VI. The volumetric determination of cerium. H. H. Willard and P. Young. *J. Amer. Chem. Soc.*, May, pp. 1322–1334, 1334–1338, 1368–1371, 1372–1378, 1379–1385.

CATALYSIS.—Preparation of catalyst by electrolytic corrosion of nickel. S. Iki. *Ind. Eng. Chem.*, May 1, pp. 472–473.

CELLULOSE.—Recent work on the oxidation of cellulose. J. L. Parsons. *Ind. Eng. Chem.*, May 1, pp. 491–493.

Cellulose resources. I. The annual wood crop. G. M. Rommell. *Ind. Eng. Chem.*, May 1, pp. 494–496.

FOOD.—Grading of commercial gelatin and its use in the manufacture of ice cream. II. A. C. Dahlberg, D. C. Carpenter, and J. C. Hening. *Ind. Eng. Chem.*, May 1, pp. 516–526. A study has been made of several methods of grading gelatins for ice-cream purposes, using both commercial samples and specially prepared high-grade gelatins of bone, porkskin, and calfskin origin.

GENERAL.—Some combustion problems in their relation to public health. S. W. Parr. *Ind. Eng. Chem.*, May 1, pp. 454–456.

ORGANIC.—The catalytic oxidation with air of ethyl, *iso*-propyl, and *n*-butyl alcohols. R. M. Simington and H. Adkins. *J. Amer. Chem. Soc.*, May, pp. 1449–1456.

The reaction of the Grignard reagent with γ-chloropropyl *p*-toluenesulphonate. A method of lengthening carbon chains by three carbon atoms. S. S. Rossander and C. S. Marvel. *J. Amer. Chem. Soc.*, May, pp. 1491–1496.

Thermal decomposition of organic sulphur compounds. W. F. Faragher, J. C. Morrell, and S. Comay. *Ind. Eng. Chem.*, May 1, pp. 527–532. The object of this investigation was to study the thermal decomposition of organic sulphur compounds and to relate the results to the changes which take place during the refining and cracking of oil.

SOLVENTS.—Cellosolve and its derivatives in nitrocellulose lacquers. E. W. Reid and H. E. Hofmann. *Ind. Eng. Chem.*, May 1, pp. 497–504. Deals with ethylene glycol monoethyl ether ("Cellosolve") and its acetate and butyrate, which are finding wide application in the lacquer industry. The properties of each solvent are discussed and comment is made on the use of various resins in connection with them. The manufacture of lacquers involving the use of the glycol ethers is discussed and typical formulae are given for lacquers suitable for use in the automobile, furniture and brush lacquer fields.

German

APPARATUS.—A new microcolorimeter and its application. H. Kleinmann. *Chemische Fabrik*, May 9, pp. 263–264; May 16, pp. 278–279.

COKE.—A new method for the determination of the reactivity of coke. J. W. Kreulen. *Zeitschrift angewandte Chem.*, May 19, pp. 498–501.

GENERAL.—Oleic, palmitic, and stearic acids as mother-substances of petroleum. N. D. Zelinsky and K. P. Lawrowsky. *Berichte*, May 9, pp. 1054–1057.

Natural gases. K. Stockfisch. *Zeitschrift angewandte Chem.*, May 12, pp. 472–475.

Cracking distillation methods in the petroleum industry. L. Singer. *Die Metallbörse*, April 25, pp. 901–902; May 9, pp. 1014–1015; May 16, pp. 1071–1072.

New theories of the constitution of silicates. I. On the new foundations of investigation of the constitution of silicates. E. Herlinger. *Zeitschrift angewandte Chem.*, May 19, pp. 488–492.

ORGANIC.—Hydrogenation with sodium amalgam. R. Willstätter, F. Seitz, and E. Bumm. *Berichte*, May 9, pp. 871–886.

Benzopolymethylene compounds. XIV. Syntheses of tetra-cyclic compounds and of pyrene. J. von Braun and E. Rath. *Berichte*, May 9, pp. 956–963.

The production of condensed ring-systems in dehydrogenation catalysis. II. Activated charcoal as reducing agent. N. D. Zelinsky and M. W. Gawerdowskaja. *Berichte*, May 9, pp. 1049–1054.

Synthetic camphor. A. Ullrich. *Die Metallbörse*, May 9, pp. 1013–1014; May 16, pp. 1069–1070. Together with a note on synthetic camphor, by L. Kaul (May 6, pp. 1070–1071).

Miscellaneous

ANALYSIS.—The determination of chlorine, bromine, and iodine in organic compounds. H. ter Meulen. *Recueil Travaux Chimiques Pays-Bas*, May 15, pp. 698–700 (in French).

CATALYSIS.—The catalytic actions of mercury and bismuth. J. B. Menke. *Recueil Travaux Chimiques Pays-Bas*, May 15, pp. 668–672 (in German). An investigation of the effect of mercury, and of salts of mercury and bismuth, on the nitration of benzene.

LOW-TEMPERATURE CARBONISATION.—Low-temperature carbonisation. F. Schwers. *Chimie et Industrie*, April, pp. 583–588 (in French).

ORGANIC.—1:3:4-oxydiazines. J. van Alphen. *Recueil Travaux Chimiques Pays-Bas*, May 15, pp. 673–681 (in English). Derivatives of the hitherto unknown 1:3:4-oxydiazine have been prepared by the action of oxalyl chloride on β-acetyl-, benzoyl, and diphenylacetyl-phenylhydrazines.

The manufacture of synthetic anthraquinone. M. Phillips. *Zeitschrift für Farbenindustrie*, March, pp. 122–124 (in English).

The migration (wandering) of the sulphonic acid group in naphthalene compounds. H. H. Hodgson. *Zeitschrift für Farbenindustrie*, March, pp. 124–126 (in English).

Hydroxycitronellal and its derivatives. R. Sornet. *Revue Chim. Industrielle*, March, pp. 74–78; April, pp. 110–113 (in French).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

288,788. Azo Dyestuffs. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 2, 1927.

These dyestuffs are obtained by coupling a diazo compound of derivatives of 2:5-diamino-1:1¹-diphenyl-sulphone, its homologues and substitution products, which are substituted in the 5-position by N-acidyl or N-alkyl groups, and which contain in the non-amino-substituted nucleus a hydroxyl and a carboxyl group in the ortho positions to each other, with a coupling component. The derivatives of 2:5-diamino-1:1¹-diphenyl-sulphone are obtained as described in Specification No. 267,366. (See The Chemical Age, Vol. XVI, p.350.) Acidyl groups in these dyestuffs can be removed by saponification, and the de-acidylated products further diazotised and coupled with a suitable component. A number of examples are given.

288,884. 1-Amino-2:4-Dichloroanthraquinone from *m*-Dichlorobenzene and Phthalic Anhydride, Manufacture of. I. Gubelmann, 1202, Fairview Avenue, South Milwaukee, H. J. Weiland, 251, Fairview Avenue, South Milwaukee and C. Stallmann, 402, North Chicago Avenue, South Milwaukee, Wis., U.S.A. Application date, August 15, 1927.

Meta-dichloro-benzene is condensed with phthalic anhydride to obtain 2¹-4¹-dichloro-*o*-benzoyl benzoic acid. This is nitrated to obtain 3¹-nitro-4¹:6¹-dichloro-*o*-benzoyl benzoic acid. The latter is reduced to the corresponding amino body, which is then treated with a dehydrating agent to eliminate one molecule of water and close the ring. The product is 1-amino-2:4-dichloro-anthraquinone. The condensing agent employed is preferably anhydrous aluminium chloride, or anhydrous ferric chloride. The dehydrating agent may be concentrated sulphuric acid, and the temperature may be 150°—160° C.

288,927. Nitro-2:3-Dichloro-1:4-Naphthoquinone, Manufacture of. O. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 22, 1927.

When 2:3-dichloro-1:4-naphthoquinone is treated with nitric acid, it is not converted into a nitro derivative, but oxidised to phthalic acid. It is now found that a nitro derivative can be obtained by employing nitric-sulphuric acid at a temperature of 30°—60° C. Examples are given.

288,957. Bromo-Derivatives of 1:1¹-Dinaphthyl-8:8¹-Dicarboxylic Acid, Manufacture of. K. Carpmael and K. S. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 19, 1926.

The mono-bromo derivative is obtained by brominating 1:1¹-dinaphthyl 8:8¹-dicarboxylic acid in glacial acetic acid. It is soluble in 80 per cent. sulphuric acid with an orange colour. The dibromo derivative is obtained by treating the 1:1¹-dinaphthyl-8:8¹-dicarboxylic acid with an excess of bromine, and is soluble in 80% sulphuric acid with an olive colour. The 1:1¹-dinaphphthyl 8:8¹-dicarboxylic acid is obtained as described in Specification No. 288,666 above.

289,103. Vat Dyestuff Preparation. R. F. Thomson, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Stirling. Application date, October 13, 1926.

Nitro-Bzl-chlorobenzanthrone described in Specification No. 256,281 (see The Chemical Age, Vol. XV, p. 255) is reduced to amino-Bzl-chloro-benzanthrone and treated with an alkaline condensing agent such as caustic potash, yielding a diamino-iso-dibenzanthrone which gives reddish-blue shades on cotton from a hydro-sulphite vat. The crude colouring matter dissolves in concentrated sulphuric acid, and may be purified by fractional precipitation. Alternatively the amino-Bzl-chloro-benzanthrone may be fused with caustic potash and parathiocresol, by which a higher efficiency is obtained in the conversion to the isodibenzanthrone derivative. In other examples, alcoholic alkali is used.

289,105. Salts of Lead, Manufacture of. S. C. Smith, 701, Salisbury House, London Wall, London, E.C.2. Application date, October 20, 1926.

A hot solution of alkali chloride is saturated with lead chloride and then treated with an equal volume of cold water which precipitates lead chloride in a pure form. The lead chloride is washed, and is then maintained in suspension in an aqueous solution of a soluble salt of arsenic, antimony, tungsten, chromium, molybdenum, or uranium. The lead chloride obtained in this manner is more active, and reacts to form the lead salt of the corresponding acid. The reaction is preferably effected at the boiling point of the solution in a reflux apparatus. Examples are given of the preparation of lead chromate, lead arsenate, and lead tungstate. A conversion of 99 per cent. is obtained, compared with 24 per cent. in the case of non-activated lead chloride.

289,111. Titanium Compounds, Manufacture of. H. Wade, London. From Titan Co. A/S, Frederiksstad, Norway. Application date, November 17, 1926.

The object is to obtain titanium compounds which are readily soluble in organic and dilute mineral acids. Hydrated oxygenated compounds of titanium such as meta-titanic acid and basic titanium sulphate can be transformed by heating at a temperature below the point of fusion, in the presence of caustic alkali or alkaline carbonate, to obtain the new products. The temperature employed is below 150° C., so that there is no corrosion of the furnace walls by molten alkali. The reacting substances may be in the form of an aqueous paste. The process is applicable for the manufacture of double salts of titanium and alkalies, such as titanium-sodium-tartrate, titanium-sodium-lactate, titanium-potassium-oxalate, and for the manufacture of mixed salts such as those of oxalic, titanic, and tartaric acids, and of titanic, oxalic and lactic acids, which are of use in the leather and textile industries.

289,170. Activation of Carbon of Carbonaceous Material, Process for. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 24, 1927.

The carbon to be activated is placed in a fireclay tube closed at both ends and surrounded by a wider, iron tube heated externally. The activating gas such as steam is passed into the space between the two tubes, and diffuses through the inner tube into the fireclay tube forming water gas with the carbon. The water gas diffuses into the intermediate space, from which it can be withdrawn. Alternatively, the steam may be passed directly into the activating space and the water gas produced diffuses into the intermediate space, and is there burnt to maintain the temperature of the activation.

289,188. Dyestuffs, Manufacture of. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester, J. Baddiley, P. Dootson, A. Shepherdson, and S. Thornley, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, February 8, 1927.

These dyes are obtained by condensing flavanthrone derivatives containing a nitrogen atom to which a reactive hydrogen atom is attached with polynuclear aromatic halogen compounds having a ring system of three or more fused nuclei, *e.g.*, chloroanthraquinone. Flavanthrone derivatives include amino-flavanthrones, and products obtained by the action of hydroxylamine on flavanthrone as described in Specification No. 282,852 (see The Chemical Age, Vol. XVII, p. 102). The halogenated substances employed for condensation include halogenated acenaphthoquinones, halogenated flavanthrones, halogenated pyranthrones, etc. Solubilising groups such as carboxyl or sulphonic groups may be present, in which case soluble dyes are obtained for dyeing wool and silk.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: 265,938 (T. Von Artner), relating to platinum contact bodies, see Vol. XVI. p. 382; 272,557 (I. G. Farbenindustrie

Akt.-Ges.) relating to catalytic oxidation of organic compounds, see Vol. XVII, p. 173 ; 273,247 (I. G. Farbenindustrie Akt.-Ges.) relating to vat dyestuffs, see Vol. XVII, p. 201 ; 282,410 (I. G. Farbenindustrie Akt.-Ges.) relating to metal catalysts, see Vol. XVIII, p. 183.

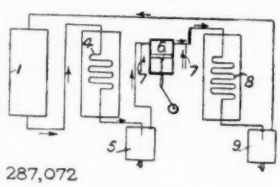
International Specifications not yet Accepted

287,066. Silica and Metal Oxide Gels. Silica Gel Corporation, 239, Redwood Street, Baltimore, U.S.A. (Assignees of E. B. Miller, c/o Silica Gel Corporation) International Convention date, March 12, 1927.

Gels of silica, tungstic acid, alumina, titanium oxide, etc., are prepared by heating the hydrogel slowly to 175°-325° F. under conditions which prevent dehydration, and slowly cooling it.

287,072. Synthetic Ammonia. Nitrogen Engineering Corporation, 331, Madison Avenue, New York. (Assignees of R. S. Richardson, River Road, Teaneck, N.J., U.S.A.) International Convention date, March 12, 1927.

Gases from the reaction chamber 1 pass through a condenser 4, and part of the ammonia collects in a vessel 5. The



287,072

gases pass on to a circulating pump 6, and fresh gas is introduced on both sides, at 7. A second condenser 8 removes more ammonia which collects in vessel 9, and the gas returns to the chamber 1. The ammonia removed in the condenser 8 takes the impurities from the added gases, and from the lubricating oil in the pump.

287,076. Sulphonated Oxyfatty Acids. H. Flesch, 135, Kettenhofweg, Frankfort-on-Main, Germany. (Assignees of Farb- and Gerbstoffwerke C. Flesch, 11, Weissfrauenstrasse, Frankfort-on-Main, Germany. International Convention date, March 14, 1927.

Oxy-fatty acids are treated with finely divided sulphuric acid containing 5–10 per cent. sulphur trioxide. Ricinoleic acid is thereby converted into sulpho-dioxystearic acid.

287,095. Condensation Products of Alcohols and Ketones with Urea, etc. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 14, 1927. Addition to 278,390. (See The Chemical Age, Vol. XVII, p. 515).

Urea, thiourea, or a derivative is condensed with an alcohol, a ketone, or a derivative, in the presence of one or more aromatic or hydroaromatic amines or acid amides containing at least one unsubstituted hydrogen atom attached to nitrogen. Oily products are obtained, which are converted on heating into resinous materials which can be used as softening agents for cellulose esters.

287,110. Dichlortoluidines. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 15, 1927.

1-methyl-2-amino-5-chlorobenzene is nitrated in sulphuric acid, the amino group diazotized and replaced by chlorine by means of cuprous chloride, and the nitro group reduced to obtain 1-methyl-2 : 5-dichloro-4-aminobenzene.

287,133. Potassium Nitrate ; Nitric Oxide. Kali-Industrie Akt.-Ges., T. Thorssell, and A. Kristensson, 139, Hohenzollernstrasse, Kassel, Germany. International Convention date, March 16, 1927.

Potassium chloride is treated with nitric acid up to 35 per cent. strength, and the potassium nitrate removed. The liquor is treated with ferrous chloride or copper to reduce the nitrogen compounds to nitric oxide, which is driven off and converted into nitric acid. The potassium nitrate may be more completely removed by cooling to −20° C. If ferrous chloride has been used, the solution may be distilled to remove hydrochloric acid, and the ferric chloride reduced by means of iron, sulphuretted hydrogen, or sulphurous acid for use again.

287,135. Acetic Acid. J. Kárpáti, 15, Debröi Utca, Budapest, and M. G. Hubsch, 48, Csengery Utca, Budapest. International Convention date, March 16, 1927.

Acetylene and oxygen are passed into glacial acetic acid containing a mercury salt and cellulose fibres, sawdust, shavings, or straw, which have been heated in nitrogen and activated with high pressure steam. Only sufficient water for the hydration of the acetylene should be present, and the temperature should be 35°-40° C. Acetic acid is produced.

287,177. Dicyandiamide-aldehyde Condensation Products. K. Ripper, 23, Winterfeldtstrasse, Berlin. International Convention date, March 18, 1927.

Dicyandiamide or a derivative is condensed with formaldehyde or other aldehyde or a polymer to form hydrophobe products which are converted by cold water into fine powders which can be moulded or pressed. Examples are given.

287,178. Dye Intermediates. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 18, 1927. Addition to 281,290. (See The Chemical Age, Vol. XVIII, p. 104).

1 : 2 : 3–Trichlorbenzene is treated with chlorsulphonic acid, and the 1 : 2 : 3-trichlorbenzene-4-sulphochloride is reduced with zinc dust and sulphuric acid. The resulting mercaptan is steam distilled and condensed in alkaline solution with chloracetic acid. Other examples are also given, the products being trihalogen-aryl-thioglycollic acids.

287,179. Benzodiazine Condensation Products. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 18, 1927.

Intermediates for the manufacture of dyestuffs and pharmaceutical products are made by condensing quinazoline or a homologue, analogue or substitution product which is halogen substituted in the diazine ring, with an organic component such that the halogens are replaced by one or two direct carbon-to-carbon linkages. The process is particularly applicable to 2 : 4-dihalogen-quinazolines. Thus, a solution of 1-hydroxy-naphthalene in tetrachlorethane is heated with 4-chlorquinazoline or 2 : 4-dichlorquinazoline in the presence of aluminium chloride to obtain 4-mono-4¹-hydroxy-naphthyl-quinazoline or 2 : 4-di-(4¹-hydroxy-naphthyl)-quinazoline. Other examples are also given.

287,471. Purifying Oils and Tars. F. C. Bunge, Mikolow Poland. International Convention date, March 21, 1927.

Low temperature tars are treated with phosphoric or other acid in the presence of a neutral diluent such as the purified oil to remove acid constituents. Water may be evaporated or removed by phosphorous pentoxide. The acid constituents may be obtained by adding substances which combine with the phosphoric acid, and may be used as disinfectants or for flotation purposes.

287,479. Dyes. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 21, 1927.

Azo dyestuffs are obtained by coupling a diazotized dihalogen-*m*-toluidine with a component capable of being taken up by the fibre, such as an arylide of 2:3-oxynaphthoic acid or of a β-keto-carboxylic acid. The dyes are fast to kier-boiling, chlorine and light. A large number of examples are given, the colours obtained being specified.

287,525. Distilling and Cracking Oils. H. Magnus, Au, near Breisgau, Freiburg, Germany. International Convention date, March 23, 1927.

Mineral oils and tars are distilled under pressure in the first of two or more vessels in series. The products are separated by fractional condensation into fractions of lower and higher boiling point than gasoline, and the heavier constituents are further cracked at higher temperature and pressure. The residue from the fractionation of the lighter constituents is cracked in the following vessels in series, which are connected in closed circuit.

287,558. Purifying Gases. Soc. L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude, 48, Rue St. Lazare, Paris. International Convention date, March 25, 1927. Addition to 281,675.

Coke oven gas is hydrogenated in the presence of a catalyst such as reduced copper or iron at a low temperature and atmo-

spheric pressure, to separate nitrogen oxides. Ethylene is not affected, but acetylene is hydrogenated. Or nitrogen oxides can be removed by treating at a high temperature with ammonium sulphate solution.

287,568. CONDENSATION PRODUCTS FROM THIOUREA, ETC. AND ALDEHYDES. K. Ripper, 23, Neue Winterfeldstrasse, Berlin. International Convention date, March 25, 1927.

Thiourea or its derivatives, with or without urea or its derivatives is condensed with formaldehyde or its polymers to obtain a hydrophobe resin which disintegrates into powder on contact with water. The urea may be replaced by the initial condensation products with formaldehyde, *e.g.*, methylol urea and methylolthiourea. The powder obtained can be moulded by heat and or pressure, and fillers and other substances may be added. Examples are given.

287,577. TREATING GASEOUS MIXTURES. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude, 48, Rue St. Lazare, Paris. International Convention date, March 25, 1927.

Gaseous mixtures containing hydrogen, *e.g.*, coke oven gas, are freed from tar and passed over iron which has been used as a catalyst in the synthesis of ammonia, or over copper, to remove nitrogen oxides. Hydrogen may then be separated by partial liquefaction.

LATEST NOTIFICATIONS.

290,189. Manufacture of acidproof linings for vessels. I.G. Farbenindustrie Akt.-Ges. May 9, 1927.

290,192. Manufacture of condensation products from urea or derivatives thereof. I.G. Farbenindustrie Akt.-Ges. May 9, 1927.

290,193. Manufacture of accumulator plates. I.G. Farbenindustrie Akt.-Ges. May 9, 1927.

290,229. Manufacture of sulphonic acids of 6-chloro-2-amino-1-methylbenzene. I.G. Farbenindustrie Akt.-Ges. May 10, 1927.

290,230. Manufacture of yellow monoazo-dyestuffs. I.G. Farbenindustrie Akt.-Ges. May 10, 1927.

290,231. Manufacture of viscose silk. I.G. Farbenindustrie Akt.-Ges. May 10, 1927.

290,253. Manufacture of yellow azo-dyestuffs. I.G. Farbenindustrie Akt.-Ges. May 11, 1927.

Specifications Accepted with Date of Application

262,774. Dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. December 8, 1925.

265,931. Aldehyde-amine condensation products. Grasselli Chemical Co. February 12, 1926.

263,758. Catalysts for gas reactions. Deutsche Gasglulicht-Auer-Ges. December 29, 1925.

266,311. Converting coal into hydrocarbons. A. Gaertner. February 18, 1927.

271,491. Hydrogen from the gases obtained in the production of coke, Production of. R. Battig. May 20, 1926.

272,929. Separating ammonia from gases and mixtures of gases containing ammonia, Method of. F. Uhde. June 15, 1926.

279,133. Water soluble dinitroaryl-aminodiarylamines, Manufacture of. I. G. Farbenindustrie Akt.-Ges. October 18, 1926.

279,490. Metal alloys. British Thomson-Houston Co., Ltd. October 22, 1926.

283,576. 2-amino-pyridines substituted in the 5 position by iodine, Process for the manufacture of. Schering Kahlbaum Akt.-Ges. January 14, 1927.

289,920. Treating and refining petroleum, Method of. A. M. Nastukoff. January 28, 1927.

289,950. Sulphate of ammonia, Preparation of. S. Robson. February 3, 1927.

289,958. Tetranitrodianthrone, Process for the manufacture of and of 2:7-dinitroanthraquinone therefrom. K. Carpmael and K. S. Carpmael. (*I. G. Farbenindustrie Akt.-Ges.*) February 4, 1927.

289,959. Anhydrides of acetic acid, and homologues and halogen derivatives, Process for the manufacture of. K. Carpmael and K. S. Carpmael. (*I. G. Farbenindustrie Akt.-Ges.*) February 4, 1927.

289,272. Anhydrides of aliphatic acids, Manufacture of. H. Dreyfus. February 8, 1927.

289,973. Cellulose esters and conversion products therefrom. K. Carpmael and K. S. Carpmael. (*I. G. Farbenindustrie Akt.-Ges.*) February 8, 1927.

289,980. Vat dyestuffs, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) February 14, 1927.

290,035. Lead and zinc from zinc waste, Recovery of. E. Bury and F. W. Walker. May 3, 1927.

290,045. Ammonium chloride crystals, Manufacture of. J. W. Moore, W. G. Polack, and Castner Kellner Alkali Co., Ltd. May 18, 1927. Addition to 273,093.

290,075. Fertilisers, Manufacture of. D. Tyrer. August 2, 1927.

290,089. Catalytically oxidising sulphur dioxide, Method of and apparatus for. H. G. C. Fairweather. (*Seldon Co.*) September 14, 1927.

272,190. Hydrocarbons and derivatives therefrom from coal, tars, mineral oils, and the like, Manufacture and production of. I. G. Farbenindustrie Akt.-Ges. June 1, 1926.

Applications for Patents

Altwegg, J., and Soc. Chimique des Usines du Rhône. Rendering stable the combination of 4-dimethylamino-1-phenyl-2-3-dimethyl 5-pyrazolone with butyl chloral hydrate. 14,453. May 16.

Barnes, R. S., Harris, J. E. G., Scottish Dyes, Ltd., and Thomas, J. Dyes and dyeing. 14,411. May 16.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of stable diazo compounds. 14,155. May 14.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of aqueous diazonium salt solutions. 14,156. May 14.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Separation of mixtures of α- and β-aroylamino anthraquinones, etc. 14,157. May 14.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 14,291. May 15.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphur dyestuffs. 14,292. May 15.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Welded joints. 14,293. May 15.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 14,433. May 16.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Fertilisers. 14,434. May 16.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of derivatives of carbazole. 14,549. May 17.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 14,658. May 18.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphuric acid, etc., from gypsum, etc. 14,659. May 18.

Carpmael, K. [legal representative of Carpmael, W.] (I.G. Farbenindustrie Akt.-Ges.). [Carpmael, W.]. Manufacture of azo dyestuffs. Carpmael, K. S. [legal representative of Carpmael, W.]. 14,763. May 19.

Carughi, A., and Paoloni, C. Manufacture of chloride of lime. 14,318. May 15.

Charbonneau, A. Destructive distillation. 14,423. May 16. (France, May 16, 1927.)

Charbonneau, A. Destructive combustibles. 14,424. May 16. (France, November 3, 1927.)

Comstock and Wescott, Inc., and Elkington, H. D. Recovering sulphur and iron oxide from sulphide ores. 14,522. May 17.

Comstock and Wescott, Inc., Girard, P., and Petit, F. Treating iron ores. 14,523. May 17. (United States, February 16.)

Consortium für Electrochemische Industrie Ges. and Deutsch, H. Manufacture of esters. 14,125. May 14.

Dandridge, A. G., and Scottish Dyes, Ltd. Manufacture of chemical products. 14,415. May 16.

Grillet, N. B., and Soc. Chimique des Usines du Rhône. Condensation products of polyphenols and formol. 14,555. May 17.

Hands, F. L. Manufacture of cellulose acetate. 14,457. May 16.

Herrmann, W. O. Manufacture of esters. 14,125. May 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of liquid, etc., hydrocarbons of low boiling point. 14,120. May 14. (April 21, 1927.)

I.G. Farbenindustrie Akt.-Ges. and Mond, A. L. Charging electrical furnaces. 14,123. May 14.

I.G. Farbenindustrie Akt.-Ges. Manufacture of hydrocarbons. 14,638. May 18.

I.G. Farbenindustrie Akt.-Ges. Manufacture of organic compounds from oxides of carbon and hydrogen. 14,639. May 18.

I.G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Insecticides. 14,649. May 18.

I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 14,658. May 18.

I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphuric acid, etc., from gypsum, etc. 14,659. May 18.

I.G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs. 14,435. May 16. (Germany, May 18, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of products from cellulose derivatives. 14,762. May 19. (Germany, July 4, 1927.)

Laing, B., and Nielsen, H. Rotary retorts for distillation, etc., of carbonaceous materials. 14,625. May 18.

Montecatini Soc. Generale per l'Industria Mineraria Ed Acricola. Manufacture of concentrated nitric acid. 14,769. May 19. (Italy, May 20, 1927.)

Neumann, E. Manufacture of aldol and crotonic aldehyde. 14,646. May 18.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 6d. to 1s. 11d. per gall.; pyridinised industrial, 1s. 8d. to 2s. 1d. per gall.; mineralised, 2s. 7d. to 2s. 11d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¼d. to 6¾d. per lb. Crude 60's, 2s. 3d to 2s. 4d. per gall. prompt.

ACID CRESYLIC 99/100.—2s. 8d. to 3s. per gall. 97/99.—2s. 7d. to 2s. 8d. per gall. Pale, 95%, 2s. 5d. to 2s. 6d. per gall. Dark, 95%, 2s. 2d. to 2s. 3d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Prices at works; Crude, 10½d. to 11d. per gall.; Standard Motor, 1s. 4½d. to 1s. 5d. per gall.; 90%, 1s. 5½d. to 1s. 6d per gall.; Pure, 1s. 9d. to 1s. 10d. per gall.

TOLUOLE.—90%, 1s. 4d. to 2s. per gall. Firm. Pure, 1s. 6d. to 2s. 3d. per gall.

XYLOL.—1s. 1d. to 1s. 11d. per gall. Pure, 2s. 4d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. per gall.; middle oil, 7d. to 8d. per gall. Heavy, 8⅛d. to 8¼d. per gall. Standard specification, 6¾d. to 7d. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8¼d. to 9¼d per gall. Solvent 90/160, 1s. 1½d. to 1s. 2d. per gall. Solvent 95/160, 1s. 2d. to 1s. 8d. per gall. Solvent 90/190, 9½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £8 per ton. Hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £13 to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 62s. 6d. to 65s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. to 6s. per gall. 90/180, 3s. to 4s. 6d. per gall. Heavy, 2s. 6d. to 3s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—2s. 1½d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

Acid, Boric B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 11d. to 2s. 1d. per lb. Less 5%.
Acid, Gallic.—2s. 8d. per lb. for pure crystal, in cwt. lots.
Acid, Pyrogallic, Crystals.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
Acid, Salicylic, B.P. pulv.—1s. 2½d. to 1s. 4½d. per lb. Technical.—10½d. to 11½d. per lb.
Acid, Tannic B.P.—2s. 8d. to 2s. 10d. per lb.
Acid, Tartaric.—1s. 4½d. per lb., less 5%.
Acetanilide.—1s. 5d. to 1s. 8d. per lb. for quantities.
Amidol.—7s. 6d. to 9s. per lb., d/d.
Amidopyrin.—8s. to 8s. 3d. per lb.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
Atropine Sulphate.—9s. per oz.
Barbitone.—5s. 9d. to 6s. per lb.
Benzonaphthol.—3s. 3d. per lb. spot.
Bismuth Carbonate.—11s. 4d. to 11s. 7d. per lb.
Bismuth Citrate.—10s. 4d. to 10s. 7d. per lb.
Bismuth Salicylate.—10s. 7d. to 10s. 10d. per lb.
Bismuth Subnitrate.—9s. 7d. to 9s. 10d. per lb.
Bismuth Nitrate.—6s. 7d. to 6s. 10d. per lb.
Bismuth Oxide.—14s. 7d. to 14s. 10d. per lb.
Bismuth Subchloride.—14s. 4d. to 14s. 7d. per lb.
Bismuth Subgallate.—8s. 7d. to 8s. 10d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
Bismuthi et Ammon Liquor.—Cit. B.P. in W. Qts. 1s. 1½d. per lb.; 12 W. Qts. 1s. 0½d. per lb.; 36 W. Qts., 1s. per lb.
Borax B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
Bromides.—Ammonium, 2s. 1d. to 2s. 3d. per lb.; potassium, 1s. 9½d. to 1s. 11½d. per lb.; sodium, 2s. to 2s. 2d. per lb.; granulated ½d. per lb. less; all spot. Large quantities at lower rates.
Calcium Lactate.—1s. 2d. to 1s. 3d. per lb.
Camphor.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
Chloral Hydrate.—3s. 2d. to 3s. 4d. per lb.
Chloroform.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
Creosote Carbonate.—6s. per lb.
Ethers.—S.G. ·730—11½d. to 1s. 0½d. per lb., according to quantity; other gravities at proportionate prices.
Formaldehyde.—£39 per ton, in barrels ex wharf.
Guaiacol Carbonate.—4s. 9d. to 5s. per lb.
Hexamine.—2s. 3d. to 2s. 6d. per lb.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
Hydroquinone.—3s. 9d. to 4s. per lb., in cwt. lots.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate.—B.P., 2s. 6d. to 2s. 9d. per lb. Green, 2s. 9d. to 3s. 2d. per lb.; U.S.P., 2s. 7d. to 2s. 10d. per lb.
Iron Perchloride.—18s. to 20s. per cwt., according to quantity.
Iron Quinine Citrate.—B.P., 8¾d. to 9¼d. per oz.
Magnesium Carbonate.—Light commercial, £31 per ton net.
Magnesium Oxide.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
Menthol.—A.B.R. recrystallised B.P., 16s. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
Mercurials B.P.—Up to 1 cwt lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10s. to 5s. 11d. per lb. Special prices for larger quantities.
Methyl Salicylate.—1s. 5d. to 1s. 9d. per lb.
Methyl Sulphonal.—9s. to 9s. 3d. per lb.
Metol.—9s. to 11s. 6d. per lb. British make.
Paraformaldehyde.—1s. 9d. per lb. for 100% powder.
Paraldehyde.—1s. 1d. to 1s. 4d. per lb.
Phenacetin.—2s. 6d. to 2s. 9d. per lb.
Phenazone.—4s. to 4s. 3d. per lb.
Phenolphthalein.—6s to 6s. 3d. per lb.
Potassium Bitartrate 99/100% (Cream of Tartar).—100s. per cwt., less 2½ per cent.
Potassium Citrate.—B.P.C., 2s. 4d. to 2s. 7d. per lb.; U.S.P., 2s. 3d. to 2s. 6d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb., in cwt. lots.
Potassium Iodide.—16s. 8d. to 17s. 2d. per lb., according to quantity.
Potassium Metabisulphite.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 5½d. per lb., spot.
Quinine Sulphate.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
Resorcin.—2s. 10d. to 3s. per lb., spot.
Saccharin.—55s. per lb.; in quantity lower.
Salol.—2s. 4d. per lb.
Sodium Benzoate, B.P.—1s. 8d. to 1s. 11d. per lb.
Sodium Citrate, B.P.C., 1911.—2s. 1d. to 2s. 4d. per lb., B.P.C., 1923—2s. 6d. to 2s. 7d. per lb. U.S.P., 2s. 4d. to 2s. 7d. per lb., according to quantity.
Sodium Ferrocyanide.—4d. per lb., carriage paid.
Sodium Hyposulphite, Photographic.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—95s. to 100s. per cwt. Crystals, 5s. per cwt. extra.
Sodium Salicylate.—Powder, 1s. 6½d. to 1s. 9d. per lb. Crystal, 1s. 7d. to 1s. 10d. per lb.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 1d. per lb.
Sodium Sulphite, Anhydrous.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
Sulphonal.—6s. 9d. to 7s. per lb.
Tartar Emetic, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
Thymol.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

Acetophenone.—7s. per lb.
Aubepine (ex Anethol).—10s. per lb.
Amyl Acetate.—2s. 6d. per lb.
Amyl Butyrate.—4s. 9d. per lb.
Amyl Salicylate.—2s. 9d. per lb.
Anethol (M.P. 21/22° C.).—5s. 3d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. per lb.
Benzyl Alcohol free from Chlorine.—2s. per lb.
Benzaldehyde free from Chlorine.—2s. 6d. per lb.
Benzyl Benzoate.—2s. 6d. per lb.
Cinnamic Aldehyde Natural.—15s. 6d. per lb.
Coumarin.—9s. 9d. per lb.
Citronellol.—13s. 6d. per lb.
Citral.—8s. 3d. per lb.
Ethyl Cinnamate.—6s. per lb.
Ethyl Phthalate.—2s. 6d. per lb.
Eugenol.—8s. 3d. per lb.
Geraniol (Palmarosa).—20s. per lb.
Geraniol.—6s. 6d. to 11s. per lb.
Heliotropine.—4s. 9d. per lb.
Iso Eugenol.—13s. per lb.
Linalol.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
Linalyl Acetate.—Ex Shui Oil. 14s. 6d. per lb. Ex Bois de Rose, 18s. 6d. per lb.
Methyl Anthranilate.—8s. 6d. per lb.
Methyl Benzoate.—4s. per lb.
Musk Ketone.—35s. per lb.
Musk Xylol.—7s. per lb.
Nerolin.—3s. 6d. per lb.
Phenyl Ethyl Acetate.—11s. per lb.
Phenyl Ethyl Alcohol.—10s. 6d. per lb.
Rhodinol.—38s. per lb.
Safrol.—1s. 6d. per lb.
Terpineol.—1s. 6d. per lb.
Vanillin.—16s. 6d. per lb.

Essential Oils

Almond Oil.—Foreign S.P.A., 10s. 6d. per lb.
Anise Oil.—2s. 9d. per lb.
Bergamot Oil.—26s. per lb.
Bourbon Geranium Oil.—20s. per lb.
Camphor Oil.—9d. per lb.
Cananga Oil, Java.—12s. 9d. per lb.
Cinnamon Oil Leaf.—6s. 9d. per oz.
Cassia Oil, 80/85%.—8s. per lb.
Citronella Oil.—Java, 2s. 4d. per lb., c.i.f. U.K. port. Ceylon, pure. 2s. per lb.
Clove Oil.—5s. 6d. per lb.
Eucalyptus Oil, Australian.—2s. 1d. per lb.
Lavender Oil.—Mont Blanc, 38/40%, Esters, 16s. per lb.
Lemon Oil.—13s. per lb.
Lemongrass Oil.—4s. 3d. per lb.
Orange Oil, Sweet.—45s. per lb.
Otto of Rose Oil.—Anatolian, 35s. per oz. Bulgarian, 55s. per oz.
Palma Rosa Oil.—14s. 6d. per lb.
Peppermint Oil.—Wayne County, 15s. per lb.; Japanese, 7s. 3d. per lb.
Petitgrain.—7s. 3d. per lb. Sandalwood, Mysore, 26s. 6d. per lb., 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, May 24, 1928.

BUSINESS during this week has been fair and prices are firm. Export market is a little better, with good inquiry.

General Chemicals

ACETONE continues unchanged and firm at £65 to £67 per ton.

ACID ACETIC.—Unchanged at £37 to £38 per ton for 80%, with increasing demand.

ACID FORMIC.—The position still remains firm with price unchanged at £47 per ton for 85%.

ACID LACTIC.—Unchanged.

ACID OXALIC.—Firm at £31 to £32 per ton.

ACID TARTARIC.—Unchanged at 1s. 4½d. to 1s. 5d. per lb.

AMMONIUM CHLORIDE.—Unchanged.

ALUMINA SULPHATE is firm and in short supply at £6 to £6 10s. per ton for 17–18%.

ARSENIC.—Unchanged.

BARIUM CHLORIDE is very firm at £8 5s. to £8 10s. per ton and supplies are short. Price is advancing.

COPPER SULPHATE.—Unchanged.

CREAM OF TARTAR.—Unchanged and demand continues firm at £104 per ton, less 2½% for 99–100% B.P.

FORMALDEHYDE is in good demand and the price steady at £39 10s. per ton for 40% in casks.

LEAD ACETATE.—Unchanged at £41 10s. to £42 10s. per ton for white, with brown £1 per ton less.

LEAD NITRATE.—Unchanged.

LIME ACETATE.—Unchanged.

METHYL ACETONE is still in short supply and the price remains firm at £56 to £58 per ton for 45%.

POTASSIUM CARBONATE AND CAUSTIC.—Unchanged.

POTASSIUM CHLORATE.—Unchanged at 3d. to 3¼d. per lb.; position firm.

POTASSIUM PERMANGANATE continues very firm at 5¼d. per lb. for B.P. grade with commercial ½d. per lb. less.

POTASSIUM PRUSSIATE.—Demand is good and the price has advanced from £63 10s. to £65 10s. per ton.

SODA ACETATE is in very short supply, and the position is firm at £21 15s. to £22 per ton.

SODA PHOSPHATE.—Unchanged.

SODA PRUSSIATE remains very firm and the price is unchanged at 4¾d. to 5d. per lb., according to quantity.

SODA SULPHIDE.—Unchanged.

TARTAR EMETIC is in good demand and the price steady at 11¼d. to 11¾d. per lb.

ZINC SULPHATE.—Unchanged.

Coal Tar Products

The market for coal tar products is fairly quiet, with little change to report from last week. The undernoted prices are being quoted for benzols, solvents and heavy naphthas, but little business is being transacted, and there is no confidence in the market.

MOTOR BENZOL.—1s. 5d. to 1s. 5½d. per gallon on rails.

SOLVENT NAPHTHA.—1s. 1d. to 1s. 2d. per gallon on rails at works.

HEAVY NAPHTHA.—1s. 1d. to 1s. 2d. per gallon on rails at works.

CREOSOTE OIL remains weak, the price in the North for the forward position being 6½d. per gallon on rails, while the price in London is 7d. per gallon.

CRESYLIC ACID is still weak, the 98/100% quality being quoted at 2s. 6d. per gallon f.o.b. naked, while the dark 95/97% quality remains at about 1s. 10d. to 1s. 11d. per gallon.

NAPHTHALENES are slightly weaker, the 74/76 quality being quoted at £6 per ton, and the 76/78 quality at £6 10s. to £7 per ton.

PITCH.—Very little business is being done and prices remain unchanged at 60s. to 65s. per ton f.o.b.

Latest Oil Prices

LONDON, May 23.—LINSEED OIL quiet and occasionally 2s. 6d. per ton lower. Spot, ex mill, £31 10s.; May, £30 10s.; June-August, £30 15s.; September-December, £31 10s.; January-April, £31 17s. 6d. naked. RAPE OIL slow at 5s. per ton decline. Crude extracted, £42; technical refined, £44 naked, ex wharf. COTTON OIL quiet. Egyptian crude, £34 10s.; refined common edible, £40; and deodorised, £42 per ton, naked. TURPENTINE unchanged. American, spot, 39s. 6d.; June, 39s. 9d.; and July-December, 42s. per cwt.

HULL, May 23.—LINSEED OIL.—Spot and May, £29 17s. 6d.; June, £30; July-August, £30 5s.; September-December, £31 2s. 6d. per ton, naked. COTTON OIL.—Bombay crude, £30 10s.; Egyptian crude, £33; edible refined, £37; technical, £34 15s.; deodorised, £39 per ton, naked. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., spot, £38 10s. GROUNDNUT OIL.—Crushed/extracted, £39; deodorised, £43 per ton. SOYA OIL.—Extracted and crushed, £33; deodorised, £36 10s. per ton. RAPE OIL.—Crude/extracted, £40 15s.; refined, £42 15s. per ton. TURPENTINE.—Spot, 42s. per cwt., net cash terms, ex mill. CASTOR OIL and COD OIL unaltered.

Nitrogen Products

Export.—As the consuming season is now nearly over, it is anticipated that prices will be reduced, but up to the present producers have not yet reduced their quotations. This is due to the extensive consumption which has left only a small stock available for immediate shipment. As the consumption of sulphate of ammonia increased considerably in 1927/8, and as some of the synthetic plants in construction or in contemplation will not be operating during the year 1928–9 it seems like that the reduction in price will not be a large one.

Home.—Nitram, Ltd., have announced that the home price for June, 1928, will be the same as for May. The prices for the new season will not be announced probably until early July. Merchants in various parts of the country report that buying has been well maintained during the month of May. The continuance of orders received up to time of going to press portends that the year 1927–8 will show no decline in consumption on the previous year.

Nitrate of Soda.—There is very little interest in this commodity as producers are not willing to sell under 16s. 6d. per metric quintal, as advised by the Chilian Government, whereas buyers appear to be unwilling to pay this price. Developments are awaited with interest.

South Wales By-Products

SOUTH Wales by-product activities continue to be quiet, the only feature of note being the steady demand for refined tar for road work. The demand in this product is as strong as ever, and values are being firmly upheld. Pitch has eased off slightly, and business has been done round about 60s. to 65s. per ton delivered. Naphthas are maintaining their strong position of a week ago, and the tone looks good for some time to come. Solvent naphtha changes hands at from 1s. 1d. to 1s. 2d. per gallon f.o.r.; while heavy naphtha is unchanged at from 1s. to 1s. 1d. per gallon f.o.r. Creosote is unchanged at from 7¼d. to 7¾d. per gallon f.o.r. maker's works. Crude naphthalene, which has very little call, remains at 80s. per ton f.o.r., and whizzed at 90s. per ton f.o.r. Refined tar prices are unchanged, coke oven tar selling at from 7¾d. to 8¼d. per gallon delivered, and gasworks tar at from 7¼d. to 7¾d. per gallon. Crude tar is unchanged at 50s. per ton f.o.r. Patent fuel and coke prices are unchanged, and export sales continue to be on rather moderate lines.

Chilean Nitrate: Government Action

IT was recently reported that the Chilean Government had decided to grant a subvention to nitrate producers, and that any producer selling below certain prices would run the risk of exclusion from the subvention. Later advices are to the effect that the Chilean Government intends further to protect the industry against any possible future cut in the prices of synthetic nitrogen products by the I.G. Farbenindustrie by returning to the Chilean producers an amount per metric quintal equivalent to any corresponding reduction in prices (as compared with those fixed for the past year) which the I.G. may make. This decision may have a far-reaching effect, as it appears to be an indication by the Chilean Government to present and future producers of synthetic nitrogen of its intention to protect the interests of the Chilean industry against any future price-cutting by its competitors.

Radium Find in Ontario

ACTIVITY in connection with the development of radium deposits in Haliburton County, Ontario, was foreshadowed in a recent address before members of the Canadian Progress Club at Toronto. The pitchblende ore found in Haliburton County is stated to compare favourably with that of the Belgian Congo, and a company known as the Ontario Radium Corporation has been organised for the purpose of carrying on mining.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinion.*

Glasgow, May 23, 1928.

BUSINESS in the heavy chemical market has, if anything, been a little more brisk during the past week. There are no changes of any importance to record, but prussiates, both potassium and sodium, are inclined to be firmer.

Industrial Chemicals

ACETONE.—B.G.S., £64 to £67 per ton, ex store, according to quantity.

ACID ACETIC.—98/100% glacial, £56 to £67, per ton, according to quality and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powdered, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In good demand, now quoted 7¼d. per lb., delivered, but this price could probably be shaded for improved quantities.

ACID CITRIC, B.P.—Rather easier and now offered for spot delivery at 1s. 11¼d. per lb., less 5%, ex store, quoted 1s. 11¼d. per lb., less 5%, ex wharf, to come forward.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC.—80° quality, £24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3¼d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality. £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Now quoted 1s. 4¼d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Quoted £5 10s. per ton c.i.f. U.K. ports, prompt shipment. Spot material available at about £5 15s. per ton, ex store.

ALUM LUMP POTASH.—Spot material available at about £9 per ton, ex store. Crystal Meal quoted £8 10s. per ton, ex store. Lump quality on offer from the Continent at £8 5s. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton. Powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2¼d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Continental about £19 per ton c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £16 15s. per ton c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Offered for prompt despatch from mines at £19 7s. 6d. per ton, ex wharf. Spot material on offer at £20 5s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 15s. per ton c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers, £6 12s. 6d. per ton delivered, minimum 4 ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price £4 5s. to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton f.o.r. works, or £4 12s. 6d. per ton f.o.b. U.K. ports, for export.

COPPER SULPHATE.—Quoted £25 per ton c.i.f. U.K. ports.

FORMALDEHYDE, 40%.—Offered at £35 10s. per ton c.i.f. U.K. ports. Spot material quoted £39 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £31 per ton, ex store.

LEAD, WHITE.—Quoted £31 10s. per ton, ex store.

LEAD, ACETATE.—White crystals quoted £39 15s. per ton c.i.f. U.K. ports. Brown, £38 10s. per ton c.i.f. U.K. port. Spot material on offer at £42 15s. per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand

METHYLATED SPIRIT.—Industrial quality 64° O.P., quoted 1s. 7d. per gallon, less 2% delivered.

POTASSIUM BICHROMATE.—4¼d. per lb., delivered minimum four-ton lots. Under four-ton lots ¼d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 10s. per ton, ex wharf, prompt shipment from the Continent. Spot material available at £26 10s. per ton, ex store.

POTASSIUM CHLORATE.—99¾/100%.—Powder quoted £23 10s. per ton, c.i.f. U.K. ports. Crystals. Crystals 30s. per ton extra. B.P. quality, crystals or powder offered at £32 per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE.—B.P. Crystals quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6¾d. per lb.

SODA CAUSTIC.—Powdered 98/99%, £17 17s. 6d. per ton. Solid 76/77%, £14 10s. per ton, and 70/72%, £13 12s. 6d. per ton, minimum four-ton lots, carriage paid on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—Spot material on offer at about £22 per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less. No change in price for next year.

SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works minimum four-ton lots. Under four and over two-ton lots 3 1/16d. per lb. Under two-ton lots, 3¼d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 3s. 9d. per ton, ex quay; minimum four-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Quoted £11 per ton, ex store.

SODIUM NITRITE 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE.—Now quoted 4¾d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, for unground quality, 52s. 6d. per ton delivered. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid 60/62% £9 per ton. Broken 60/62% £10 per ton. Crystals 30/32% £7 2s. 6d. per ton delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; ground American, £9 5s. per ton—ex store. Prices nominal.

ZINC CHLORIDE.—British material 98/100% quoted £24 15s. per ton f.o.b. U.K. ports. 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered 20s. per ton extra.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf, prompt shipment from the Continent.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Plassmann Carbonisation Process

THE Leeds Fireclay Co., Ltd., has put down at Farnley a small retort for dealing with 2½ tons of coal per day by the Plassmann process of low temperature carbonisation, of which the British rights have been acquired by the Leeds company. The process has been primarily for the production of smokeless domestic fuel, using fine coals and slacks.

Constructionally, the Plassmann retort is characterised by the presence of a large number of horizontal superimposed carbonising chambers in which the coal lies at rest while being treated. The carbonising chambers are less than four inches thick. The bulk of the product is smokeless fuel. The crude oils and gas are of importance, and an ordinary English coal should yield 18 to 20 gallons of crude oil per ton. Owing to the fact that in the Plassmann process the coal is entirely at rest, the tar produced is stated to be of good quality, and has a negligible dust content. A rich gas is also produced and about one gallon of petrol per ton of coal. The Leeds Fireclay Co., Ltd., has now placed an order for a 50 ton unit which will be in operation in the winter.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, May 24, 1928.

A moderately satisfactory trade has been put through this week on the chemical market here, more particularly in the leading heavy products against contract commitments for home consumers. On the " open " market current conditions are extremely patchy and on the whole, perhaps, not very active, sellers complaining of the small size of many of the orders and the narrow margins. From now on until after next week the Manchester market will be virtually closed owing to the holidays.

Heavy Chemicals

A quiet trade is reported in the case of phosphate of soda and offers of this material are fairly steady at from £12 to £12 5s. per ton. Prussiate of soda is well held at the higher rates of 4½d. to 5d. per lb., according to quantity, a moderate business being put through. With regard to caustic soda, the demand in this section has been about up to its recent level and values are firm at from £13 7s. 6d. to £15 7s. 6d. per ton, according to quality. Alkali, also, is moving off in moderate quantities with prices fully maintained on a contract basis of £6 2s. 6d. per ton for 58 per cent. material. Only a comparatively limited inquiry has been met with this week for sulphide of soda, with current offers of the 60-65 per cent. concentrated solid quality at £9 10s. to £10 per ton and of the commercial at round £8. There has been a quiet demand about for chlorate of soda at from 2¾d. to 3d. per lb. Hyposulphite of soda is selling in moderate quantities at steady prices, photographic being at about £16 5s. per ton and commercial grade at £9 to £9 10s. Bichromate of soda is in moderate request with current offers of this material at round 3d. per lb. Nitrite of soda continues firm at £19 10s. per ton and, a quietly steady business has been reported. Saltcake is rather slow, but there has been little change in the price situation, offers being at about £2 15s. per ton. With regard to bicarbonate of soda, a fair trade is passing at round £10 10s. per ton. Bleaching powder is steady and in moderate request at £7 per ton.

There has been comparatively little change in the price position of the potash compounds. Caustic potash remains quite steady, and meets with a fair inquiry on the basis of £33 5s. per ton for prompt delivery of one to five-ton lots. Yellow prussiate of potash is in rather quiet demand, but values are well held at from 6¾d. to 7¼d. per lb., according to quantity. Permanganate of potash is on the slow side, with commercial quality offering at round 4¾d. per lb. and B.P. material at 5d. to 5¼d. per lb. Carbonate of potash is still being quoted here in the neighbourhood of £25 per ton, a moderate business in this being put through. Both chlorate and bichromate of potash have been in rather quiet call at about 3d. and 4⅛d. per lb., respectively.

Among the miscellaneous products, sulphate of copper is fairly active still both on home and foreign account, offers for shipment being firm at up to £27 per ton, f.o.b. There is not much buying interest just now in the case of arsenic and the tendency is easy at £17 to £17 5s. per ton at the mines, for white powdered, Cornish makes. Acetate of lime is fairly steady although rather slow just now, with grey material quoted at about £16 per ton and brown at £9 10s. to £10. Acetate of lead is also on the quiet side but there has been little alteration in values, white being quoted at £40 and brown at round £39. Nitrate of lead is still on offer here at £37 per ton.

Acids and Tar Products

A moderate business is passing on this market in oxalic acid, offers of which are about maintained at 3¼d. per lb. Acetic acid moves off in fairly regular quantities and prices keep steady, with glacial at £66 and commercial 80 per cent. at £37 to £37 10s. Tartaric acid is on the quiet side at about 1s. 4¼d. per lb., and much the same may be said with regard to citric acid, current quotations for which are at 1s. 11d. to 1s. 11½d. per lb.

The by-products generally are rather inactive. Pitch is attracting little attention, and export values are nominal at £2 17s. 6d. to £3 per ton, f.o.b. Creosote oil is on the easy side at about 6⅞d. per lb. and buying has been on narrow lines. Solvent naphtha is steady and in quiet demand at about 1s. 2d. per gallon. Carbolic acid crystals are steady and in fair request at 6¾d. per lb., f.o.b., with crude maintained at round 2s. 5d. per gallon.

Tariff Changes

Italy.—A decree law, of April 15, adds a number of chemicals to the list of goods which may be imported into Italy under the " temporary importation " regulations.

Electro-Chemical Oxidation

Commercial Possibilities

Professor F. Fichter, past president of the Swiss Chemical Society, and director of the department of inorganic chemistry in the University of Basle, Switzerland, commenced a course of seven lectures on " Electro-Chemical Oxidation of Organic and Inorganic Compounds," on Tuesday, May 8, in the University of Birmingham. The lectures were under the auspices of the University Chemical Society. In February, Professor Haworth, head of the chemistry department of Birmingham University, on the invitation of the University of Basle, visited that institution and delivered a course of lectures on carbo-hydrates. The visit to Birmingham of Professor Fichter was in the nature of a return.

In his first lecture, Dr. Fichter explained the vigorous action developed by electrolytically-produced oxygen against organic substances, and took as examples simple aromatic hydrocarbons. We found, he said, that the danger of a complete destruction of the organic compound was always impending, and that the oxidation proceeded in most cases on several parallel lines, so that only by special devices can we find out methods for the preparation of one oxidation product. Most of the apparently smooth electrochemical oxidations claimed in the literature, especially the patent literature, had to be carefully examined (and distrusted), and tried under every possible condition to obtain satisfactory results. Speaking of four examples of this kind—the electrochemical production of vanillin, saccharine, intermediate products from dimethylaniline, and dyestuffs from azobenzene. Dr. Fitcher discussed the principles of the electrochemical reactions on which the processes were based and then discussed the possibility of a commercial process.

German Phosgene Disaster

Large District Gassed by Tank Explosion

A tank of liquid phosgene exploded on Sunday, May 20, at the Stolzenburg chemical works, which lies in the industrial district behind the docks on the southern bank of the Elbe, with the result that large quantities of the gas were released, and floated over the southern part of Hamburg and the surrounding country. Numerous casualties occurred, and up to the present eleven deaths are reported, while 250 persons are under treatment, many of them in a serious condition.

Some mystery attaches to the matter, and various conflicting statements have been made. The firm owning the works is said to be in liquidation, and no chemicals have been manufactured for some time. According to the owner, Herr Stolzenburg, the stock of phosgene (the original amount of which is put in some Press reports as high as 200 tons) was acquired by him from war-material. He states that he had a proper permit to deal with it, and that he shipped it mainly to America, although he also had a contract for delivery to Czechoslovakia. Under the law passed in Germany last year for the control of the manufacture of war-material (on the occasion of the raising of inter-Allied military control in Germany, the responsibility being handed over to the League of Nations) the production of phosgene was permitted only in factories licensed for the purpose by the German Government. It has been stated that the Stolzenburg works was not one of these, but an investigation of this and other points is now proceeding. In various German newspapers accusations have been made that Herr Stolzenburg has been concerned with the supply of phosgene to Russia, and its manufacture in that country.

Company News

PEASE AND PARTNERS.—The directors announce that no dividend will be paid on the company's shares in respect of the year ended March 31, 1928.

BARRENECHEA NITRATE CO.—The net result for the year ended December 31 last, after charging Chilean income tax, stoppage and administration expenses, is a loss of £2,595.

OAKBANK OIL CO.—The company announce a dividend on the preference shares for the past year of 6 per cent. After writing off £10,000 for depreciation of plant, etc., a balance of £20,773 goes forward to the next year.

BOOTS PURE DRUG CO.—The directors report a profit of £701,972 for the year ended March 31 last, as against £641,732 for the previous 12 months. A bonus of 9d. per share (less tax) is recommended on the ordinary shares.

YOUNG'S PARAFFIN CO.—The accounts for the past year show that, after transferring £10,000 from reserve, providing for depreciation, and deducting £16,732 for debenture interest, a balance of £9,868 remains to be carried forward.

STEVENSON AND HOWELL.—The net profits for the year 1927 were £41,302 and £100,622 was brought forward. A final dividend of 11 per cent. is proposed, making 16 per cent. for the twelve months, tax free, placing £2,000 to the reserve fund, and carrying forward £113,174.

HOLBOROUGH CEMENT CO.—The net profits for 1927 amounted to £62,548, and £16,239 was brought forward. It is proposed to write £39,175 off preliminary expenses, appropriate £20,000 for depreciation, and after writing off balance of compensation to late officials of the company, there remains £11,636, which it is proposed to carry forward.

SANTA RITA NITRATE.—For the twelve months ended December 31, 1927, the report states that stoppage and administration expenses, comprising Chilean income-tax, interest and discount amount to £8,823, and trading profit, including interest on War Loan and trading fees, amount to £5,746, difference of £3,077 has been carried to the debit of profit and loss account.

LAGUNAS NITRATE CO.—The report for the twelve months ended December 31, 1927, states that the gross profit, including transfer fees, interest on investments and bank deposit amounted to £11,857. Disbursements comprising stoppage expenses, English, French and Chilean taxes and administration charges, were £10,980; the difference, £877, has been carried to credit of profit and loss account.

A. B. FLEMING AND CO.—The amount of credit of profit and loss for the year ended April 30 last is £55,110, which includes £16,161 brought in. A sum of £11,000 is placed to general reserve, making it £65,000; £5,000 is placed to new buildings and plant expenditure, and £1,000 to staff pension fund. A dividend of 15 per cent., less tax, is recommended, of which 5 per cent., actual, was paid in November last year; and £15,610 is carried forward.

CRAIG AND ROSE.—The report for the year ended March 31, 1928, states that, after providing for income-tax, depreciation and directors' fees, the profits amount to £13,658. The directors have written down investment account by £3,500, leaving £10,158, to which falls to be added balance brought forward of £6,679, making £16,837. A dividend is recommended on the ordinary shares at the rate of 5 per cent. per annum, free of income-tax, carrying forward £6,837.

NITRATE PRODUCERS' STEAMSHIP CO.—For the year ended April 30 last, the report states that the accounts show a profit of £107,403, to which is added balance brought forward of £15,455, making a total of £122,858. From this must be deducted general expenses, directors' fees, income-tax, interest and interim dividend, amounting to £28,132, leaving £94,725 for appropriation. It is proposed to pay a dividend at the rate of 7½ per cent. per annum for the final six months of the year, together with a bonus of 2½ per cent., both free of income-tax, and to place £70,000 to reserve for depreciation, leaving £14,957 to be carried forward.

CHLORIDE ELECTRICAL STORAGE.—The report for the year ended March 31, 1928, states that the profit, after depreciation and taxation have been provided for, was £185,097. After deducting interim dividend on the preference shares and ordinary shares the balance is £166,755, to which must be added £47,352 brought forward, making an available balance of £214,107. The directors recommend a dividend at the rate of 6 per cent. per annum on the preference shares for the year, less interim dividend, previously paid, and a further dividend of 5 per cent. and a bonus of 3s. per share, both free of tax, on the ordinary shares, an appropriation of £11,500 for benefit of employees, namely, a payment of £10,000 to the employees' pension fund and an allocation to the employees' benefit fund of £1,500; a transfer of 75,000 to reserve fund (making £300,000), and that a balance of £59,822 be carried forward.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to June 9, 1928.

ETHERIUM.

486898. Class 1. A preparation to be immersed in petrol tanks for preventing knock in internal cumbustion engines and for anti-corrosive purposes. Actinium Developments, Ltd., 617-618, Alder House, Aldersgate Street, London, E.C.1, manufacturers. December 16, 1927. (To be Associated. Sect. 24.)

FERRODEC.

488604. Class 1. Paints, varnishes, enamels, dry colours, distempers, japans, lacquers, driers, wood preservatives, anti-corrosive and anti-fouling compositions, and anti-corrosive oils. Sissons Brothers and Co., Ltd., Bankside, Sculcoates, Hull; varnish paint, colour, and oil manufacturers.—February 17, 1928.

UNIAVIRO.

488844. Class 1. Chemical substances used in manufactures. H. Th. Böhme Aktien-Gesellschaft (a joint stock company organised under the laws of Germany), 29, Moritzstrasse, Chemnitz, Germany; manufacturers.—February 24, 1928.

BRILLFAST.

489088. Class 1. Paints, varnishes, enamels, colours, distempers, japans, lacquers, driers, wood preservatives, wood stains, anti-corrosive and anti-fouling compositions, and anti-corrosive oils. J. W. and T. A. Smith, Ltd., 247 and 249, Old Ford Road, London, E.3; colour manufacturers.—March 3, 1928.

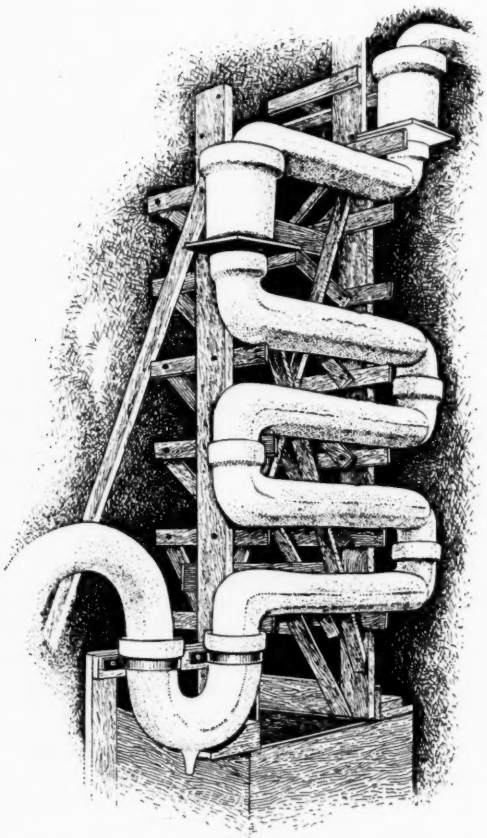
GRAVITOL.

489382. Class 3. Chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34, Basinghall Street, London, E.C.2; merchants and manufacturers.—March 13, 1928.

International Peat Congress

AN International Peat Congress is to be held at Laon (Aisne), France, in the period July 8 to 12. The labours of the First Congress of Peat, which was held in September, 1927, at Notre-Dame-de-Liesse near Laon (Aisne), proved that peat is a product capable of bringing not alone to France but to every country a source of additional wealth. The members of the Congress of 1927, on adjourning, resolved to invite, in 1928, all nations to participate in the Second Congress, thus making it of an international character. Foreign delegates are invited to visit Laon to observe what has been achieved in French technique, and at the same time to make their own contribution to the promotion of this valuable natural product. The activities of the congress will include the reading and discussion of communications, an exposition of machinery of extraction, treatment and utilisation of peat, of verified investigations, and a convention of peat workers. Those interested are requested to communicate with the Secrétariat du Congrès International de la Tourbe, Office National des Combustibles Liquides, 85, Boulevard du Montparnasse, Paris (6e), France.

The "VITREOSIL"



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Non-Ferrous Metals Research

Association's Report and Annual Meeting

THE British Non-Ferrous Metals Research Association has just issued its annual report for the year 1927, which may be obtained from the headquarters, 71, Temple Row, Birmingham. The number of subscribing members is now 144; subscriptions during the year totalled £10,064, and expenditure on researches, £20,476; the number of researches in progress was 21; and the percentage of total expenditure devoted to experimental work was 83½ per cent. The growing interest in the work of the Association is shown by the number of major technical inquiries by members, which totalled 197, as compared with 126 in 1926. One of the features of the year 1927 was the founding of a section dealing with industrial applications and development, and it is hoped to mobilise a staff to foster the application in works practice, by members of the Association, of research results obtained by the Research Association and others. The Department of Scientific and Industrial Research has shown its confidence in the Association by a generous revision of the terms of the grant for the years 1927, 1928, and 1929, conditional on greater efforts being made to strengthen its position.

Among the subjects of researches in progress in 1927 were the effect of impurities on the properties of copper; atmospheric corrosion; improved alloys for high temperature service; electro-deposition; metallurgical applications of the spectroscope; and the jointing of metals.

Need to Become Self-Supporting

The annual meeting of the Association was held in Birmingham on Monday, May 14, Mr. T. Bolton presiding over a large gathering. Mr. Bolton said that the department of Scientific and Industrial Research had treated the Association generously, but within the next year it would have to become self-supporting.

Professor D. Hanson, of Birmingham University, said a recent visit to America had shown him that research had developed enormously there during the last ten years, and had produced some of the most valuable contributions to fundamental metallurgical science that had been obtained during the whole history of that science. The point was that the research was being financed wholly by industrial concerns. The biggest problem to be faced was the putting of research into practice. The only way to do that was to place the operations of the factories largely in the hands of men capable of understanding scientific advances and methods. That was what was being done in America.

Sulphites in Beer

THERE was a discussion on sulphites in beer at a meeting of the Yorkshire and North-Eastern Section of the Institute of Brewing at the Queen's Hotel, Leeds, following a paper on "Sulphites," by Mr. Harold Heron, of London. Mr. Chubb, of Tadcaster, who presided, asked what concentration of sulphites would be necessary to flavour beer, and pointed out that the flavour used to be noticeable in a beer from a certain part of the country. He believed that the flavour was most marked in white wine. Mr. Heron replied that the concentration of sulphites in beer would depend upon the gravity and delicacy of the drink. Nowadays the Ministry of Health allowed 70 parts of sulphites to a million in beer, whereas years ago one firm used 100 parts. The 100 parts would certainly flavour beer. In wine the maximum was 400 parts, and in cider 200 parts. The brewers had found 70 parts sufficient. At one time they wanted more, but experiments had proved that beer with 100 parts did not show the same stability as beer containing 50 parts.

Manchester College of Technology: Summer Courses

THE Manchester Municipal College of Technology has issued a prospectus of short courses of lectures and laboratory work to be given during the summer. The courses in chemistry and chemical technology will deal with electrolysis in chemical industry, the natural colouring matters, paper making for printers, the coking of coal, some modern fermentation processes, practical inorganic chemistry, advanced practical organic chemistry for B.Sc. (London) and A.I.C., the identification of dyestuffs on the fibre (mainly concerned with coloured artificial silks), and practical cereal chemistry.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

MOSSLEY OIL CO., LTD., Audley Street Works, Mossley, near Manchester, oil refiners. (C.C., 26/5/28.) £17 4s. 4d. April 21.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

STANDARD SOAP CO., LTD., Ashby-de-la-Zouch. (M., 26/5/28.) Registered May 10, £22,000 debenture to Mosley Street Nominees, Ltd., 38, Mosley Street, Manchester; charged on company's premises, etc., also general charge.

Satisfaction

LODERS AND NUCOLINE LTD., London, E.C., oil refiners. (M., S., 26/5/28.) Satisfaction registered May 5 £100,000 registered April 2, 1917.

London Gazette, &c.

Notice of Dividend

PARCELL, Luther Livingstone, Wold Road, Barrow-on-Humber, Lincolnshire, soap and disinfectant manufacturer, trading as L. PARCELL AND CO. First and final dividend, 11⅝d. per £, payable May 23, Official Receiver's Office, St. Mary's Chambers, Great Grimsby.

New Companies Registered

AVA, LTD. Registered May 18. Nom. Capital, £30,000 in £1 shares. To acquire from Paul Villain the several letters patent, trade marks, designs, trade designations, secrets and processes and the goodwill connected therewith, and to carry on the business of soap makers and dealers, candle makers, manufacturers of and dealers in perfumes, colours, dyes, paints, alcohol, aromatic hydrocarbons and their derivatives, etc. Subscribers: J. Dawson, 63, Cricketfield Grove, Leigh-on-Sea.

BITUMINOUS COMPOSITIONS, LTD., 107, Victoria Street, Grimsby. Registered May 19. Nom. capital, £3,000 in £1 shares (1,000 6% cumulative preference and 2,000 ordinary). Manufacturers of or dealers in all kinds of graphite, oil, paint, water-proofing and road compounds, grease, tallow, cements, powders, polishes, wastes, chemicals and chemical substances, etc. Directors: F. W. Gough, J. Robb, and C. H. Grimshaw.

REX CAMPBELL AND CO., LTD., 7, Idol Lane, Eastcheap, E.C. Registered May 17. Nom. capital, £1,100 in £1 shares (1,000 preference and 100 ordinary). To sell certain products manufactured by the Chemical Supply Co., Ltd., and to carry on the business of merchants, agents, dealers, wholesale warehousemen and shippers in chemicals, chemical products, wax, oils, gum, etc. Directors: F. Neumann and R. Campbell.

ESSEX MALT VINEGAR CO., LTD., 58, Frith Street, Soho Square, London, W.1. Registered May 17. Nom. capital, £5,000 in £1 shares. Distillers and manufacturers of and dealers in vinegar, acetic acid, glucose, etc. Directors, G. I. de B. Phelps and J. H. Deacon.